

# DOCUMENT RESUME

ED 112 156

CE 004 960

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 TITLE Determination of the Basic Mathematics Skill Needs and the Need for Mathematics Remediation for Secondary Vocational Education Students.  
 INSTITUTION Pennsylvania State Univ., University Park. Dept. of Vocational Education.  
 SPONS AGENCY Pennsylvania State Dept. of Education, Harrisburg. Bureau of Vocational, Technical, and Continuing Education.  
 PUB DATE Apr 73  
 NOTE 150p.  
 EDRS PRICE MF-\$0.76 HC-\$6.97 Plus Postage  
 DESCRIPTORS Basic Skills; Educational Assessment; Educational Needs; Relevance (Education); \*Remedial Mathematics; Secondary Education; \*Secondary School Mathematics; \*State Surveys; \*Student Needs; Tables (Data); Teacher Response; \*Vocational Education  
 IDENTIFIERS Pennsylvania

## ABSTRACT

On an optical scanning survey form listing 66 basic mathematics skills, all secondary vocational teachers in Pennsylvania were asked to identify mathematical skills essential to success and skills in need of remediation for their specialties. Of 4,839 forms sent out, data from 3,404 yielded the 122 tables (121 pages) of findings arranged according to 61 specialties in the general areas of trade and industrial, technical, agricultural, home economics, business, and distributive education occupations. Two tables for each specialty are presented, ranking the skills according to essentiality for success and according to teacher perceived need for remediation. For each skill, the rank earned, the number of teachers responding to the item, and the percentage of the group establishing the rank are reported. Pooled rankings of essential and remedial skills are also shown for each vocational area. Every skill is found high in either or both the essentiality or need for remediation rankings. These findings indicate much variation and suggest the need for remediation in all basic mathematics skills. Several implications for using the data to personalize mathematics skill development are stated. A 12-item reference list, sample inventory form, and a vocational specialties list conclude the report. (MS)

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PENNSYLVANIA  
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VOCATIONAL  
EDUCATION

# DETERMINATION OF THE BASIC MATHEMATICS SKILL NEEDS AND THE NEED FOR MATHEMATICS REMEDIATION FOR SECONDARY VOCATIONAL EDUCATION STUDENTS

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Research Coordinating Unit (Project No. 19-1042)

## VOCATIONAL — TECHNICAL EDUCATION Research Report

APRIL, 1973

2/3

## ABSTRACT

This study determined which basic mathematics skills are necessary for success in various secondary vocational programs. It also determined which basic mathematics skills need most remedial attention in students entering secondary vocational programs.

Project data provide valuable information to vocational teachers and administrators, counselors, mathematics department chairmen and teachers, and curriculum specialists. Data will be useful in counseling pre-vocational students. They will be helpful in identifying the need for and in planning remedial programs for present and future vocational students. They might also promote the development of mathematics curricula which will better serve vocationally oriented students.

## PREFACE

This project came about primarily from the principal investigator's more than ten years experience in the public schools of Pennsylvania. During these years teacher lamentations were heard citing the basic skill deficiencies of many students enrolled in the secondary schools. Particular citations were noted from vocational educators. Personal pilot study results seemed to corroborate teachers' complaints, thus paving the way for this much larger project.

Many persons assisted in this effort. First, I wish to thank the research assistants, Thomas E. Enderlein, Joseph A. Ford, and Elizabeth C. King, who so ably handled their many diverse tasks. I also acknowledge the consultation of Dr. Edwin L. Herr, with whom the pilot study was reported, and Drs. Angelo C. Gillie and Jerome T. Kapes for their assistance during collection and analysis of the data.

I particularly thank the teachers of this state who provided the data for this study.

Lastly, I thank Dr. Ferman Moody and Dr. Clarence Dittenhafer of the Pennsylvania Research Coordinating Unit for their assistance and support during trying times.

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## LIST OF TABLES

Because of the large number of tables resulting from this study, the tables are categorized by vocational division, with specialties within each division being listed in alphabetical order.

For ease of reference in this listing, table titles are shortened and they are numbered in arabic notation. The order of table presentation was established by the pattern used for the U.S.O.E. - Pennsylvania Course Code Equivalence Table found in the Pennsylvania Vocational Education Directory - 1971.

### TRADE AND INDUSTRIAL OCCUPATIONS

	PAGE
Air Conditioning and Heating	
TABLE 1 Mathematics Skills Ranked on Essentiality	9
TABLE 2 Mathematics Skills Ranked on Need for Remediation	10
Appliance Repair	
TABLE 3 Mathematics Skills Ranked on Essentiality	11
TABLE 4 Mathematics Skills Ranked on Need for Remediation	12
Automotive Body	
TABLE 5 Mathematics Skills Ranked on Essentiality	13
TABLE 6 Mathematics Skills Ranked on Need for Remediation	14
Automotive Mechanic	
TABLE 7 Mathematics Skills Ranked on Essentiality	15
TABLE 8 Mathematics Skills Ranked on Need for Remediation	16
Building Construction-Maintenance	
TABLE 9 Mathematics Skills Ranked on Essentiality	17
TABLE 10 Mathematics Skills Ranked on Need for Remediation	18

## Carpentry

TABLE 11	Mathematics Skills Ranked on Essentiality	19
TABLE 12	Mathematics Skills Ranked on Need for Remediation	20

## Cosmetology

TABLE 13	Mathematics Skills Ranked on Essentiality	21
TABLE 14	Mathematics Skills Ranked on Need for Remediation	22

## Drafting

TABLE 15	Mathematics Skills Ranked on Essentiality	23
TABLE 16	Mathematics Skills Ranked on Need for Remediation	24

## Dressmaking Related

TABLE 17	Mathematics Skills Ranked on Essentiality	25
TABLE 18	Mathematics Skills Ranked on Need for Remediation	26

## Electrical Maintenance Construction

TABLE 19	Mathematics Skills Ranked on Essentiality	27
TABLE 20	Mathematics Skills Ranked on Need for Remediation	28

## Electronics

TABLE 21	Mathematics Skills Ranked on Essentiality	29
TABLE 22	Mathematics Skills Ranked on Need for Remediation	30

## Industrial Electrical

TABLE 23	Mathematics Skills Ranked on Essentiality	31
TABLE 24	Mathematics Skills Ranked on Need for Remediation	32

## Interior-Commercial Art

TABLE 25	Mathematics Skills Ranked on Essentiality	33
TABLE 26	Mathematics Skills Ranked on Need for Remediation	34

## Machine Tool Die

TABLE 27	Mathematics Skills Ranked on Essentiality	35
TABLE 28	Mathematics Skills Ranked on Need for Remediation	36

## Masonry

TABLE 29	Mathematics Skills Ranked on Essentiality	37
TABLE 30	Mathematics Skills Ranked on Need for Remediation	38

## Metal Trades

TABLE 31	Mathematics Skills Ranked on Essentiality	39
TABLE 32	Mathematics Skills Ranked on Need for Remediation	40

	PAGE
Mill and Cabinet Making	
TABLE 33 Mathematics Skills Ranked on Essentiality	41
TABLE 34 Mathematics Skills Ranked on Need for Remediation	42
Printing and Graphic Arts	
TABLE 35 Mathematics Skills Ranked on Essentiality	43
TABLE 36 Mathematics Skills Ranked on Need for Remediation	44
Plumbing	
TABLE 37 Mathematics Skills Ranked on Essentiality	45
TABLE 38 Mathematics Skills Ranked on Need for Remediation	46
Sheet Metal	
TABLE 39 Mathematics Skills Ranked on Essentiality	47
TABLE 40 Mathematics Skills Ranked on Need for Remediation	48
Trade and Industrial Others (N.E.C. - Not Elsewhere Classified)	
TABLE 41 Mathematics Skills Ranked on Essentiality	49
TABLE 42 Mathematics Skills Ranked on Need for Remediation	50
Welding	
TABLE 43 Mathematics Skills Ranked on Essentiality	51
TABLE 44 Mathematics Skills Ranked on Need for Remediation	52
Woodworking	
TABLE 45 Mathematics Skills Ranked on Essentiality	53
TABLE 46 Mathematics Skills Ranked on Need for Remediation	54
Total Sample Trade and Industrial Occupations	
TABLE 47 Mathematics Skills Ranked on Essentiality	55
TABLE 48 Mathematics Skills Ranked on Need for Remediation	56

#### TECHNICAL OCCUPATIONS

Building Technology	
TABLE 49 Mathematics Skills Ranked on Essentiality	57
TABLE 50 Mathematics Skills Ranked on Need for Remediation	58
Chemical Technology	
TABLE 51 Mathematics Skills Ranked on Essentiality	59
TABLE 52 Mathematics Skills Ranked on Need for Remediation	60

	PAGE
Drafting Design	
TABLE 53 Mathematics Skills Ranked on Essentiality	61
TABLE 54 Mathematics Skills Ranked on Need for Remediation	62
Electronics Technology	
TABLE 55 Mathematics Skills Ranked on Essentiality	63
TABLE 56 Mathematics Skills Ranked on Need for Remediation	64
Technical Others (N.E.C.)	
TABLE 57 Mathematics Skills Ranked on Essentiality	65
TABLE 58 Mathematics Skills Ranked on Need for Remediation	66
Total Sample - Technical Occupations	
TABLE 59 Mathematics Skills Ranked on Essentiality	67
TABLE 60 Mathematics Skills Ranked on Need for Remediation	68

#### HEALTH OCCUPATIONS

Dental Occupations	
TABLE 61 Mathematics Skills Ranked on Essentiality	69
TABLE 62 Mathematics Skills Ranked on Need for Remediation	70
Health Assistant	
TABLE 63 Mathematics Skills Ranked on Essentiality	71
TABLE 64 Mathematics Skills Ranked on Need for Remediation	72
Health Other (N.E.C.)	
TABLE 65 Mathematics Skills Ranked on Essentiality	73
TABLE 66 Mathematics Skills Ranked on Need for Remediation	74
Total Sample - Health Occupations	
TABLE 67 Mathematics Skills Ranked on Essentiality	75
TABLE 68 Mathematics Skills Ranked on Need for Remediation	76

#### AGRICULTURAL OCCUPATIONS

Agricultural Mechanics	
TABLE 69 Mathematics Skills Ranked on Essentiality	77
TABLE 70 Mathematics Skills Ranked on Need for Remediation	78



	PAGE
Agriculture Other (N.E.C.)	
TABLE 71 Mathematics Skills Ranked on Essentiality	79
TABLE 72 Mathematics Skills Ranked on Need for Remediation	80
Agricultural Production	
TABLE 73 Mathematics Skills Ranked on Essentiality	81
TABLE 74 Mathematics Skills Ranked on Need for Remediation	82
Horticulture	
TABLE 75 Mathematics Skills Ranked on Essentiality	83
TABLE 76 Mathematics Skills Ranked on Need for Remediation	84
Total Sample - Agricultural Occupations	
TABLE 77 Mathematics Skills Ranked on Essentiality	85
TABLE 78 Mathematics Skills Ranked on Need for Remediation	86

#### GAINFUL HOME ECONOMICS OCCUPATIONS

Child Care-Guidance	
TABLE 79 Mathematics Skills Ranked on Essentiality	87
TABLE 80 Mathematics Skills Ranked on Need for Remediation	88
Gainful Home Economics Other (N.E.C.)	
TABLE 81 Mathematics Skills Ranked on Essentiality	89
TABLE 82 Mathematics Skills Ranked on Need for Remediation	90
Food Production	
TABLE 83 Mathematics Skills Ranked on Essentiality	91
TABLE 84 Mathematics Skills Ranked on Need for Remediation	92
Total Sample Gainful Home Economics Occupations	
TABLE 85 Mathematics Skills Ranked on Essentiality	93
TABLE 86 Mathematics Skills Ranked on Need for Remediation	94

#### USEFUL HOME ECONOMICS SPECIALTIES

Child Development	
TABLE 87 Mathematics Skills Ranked on Essentiality	95
TABLE 88 Mathematics Skills Ranked on Need for Remediation	96

	PAGE
Clothing Textiles	
TABLE 89 Mathematics Skills Ranked on Essentiality	97
TABLE 90 Mathematics Skills Ranked on Need for Remediation	98
Comprehensive Home Economics	
TABLE 91 Mathematics Skills Ranked on Essentiality	99
TABLE 92 Mathematics Skills Ranked on Need for Remediation	100
Consumer Education	
TABLE 93 Mathematics Skills Ranked on Essentiality	101
TABLE 94 Mathematics Skills Ranked on Need for Remediation	102
Family Relations	
TABLE 95 Mathematics Skills Ranked on Essentiality	103
TABLE 96 Mathematics Skills Ranked on Need for Remediation	104
Food and Nutrition	
TABLE 97 Mathematics Skills Ranked on Essentiality	105
TABLE 98 Mathematics Skills Ranked on Need for Remediation	106
Housing-Home Furnishings	
TABLE 99 Mathematics Skills Ranked on Essentiality	107
TABLE 100 Mathematics Skills Ranked on Need for Remediation	108
Useful Home Economics Other (N.E.C.)	
TABLE 101 Mathematics Skills Ranked on Essentiality	109
TABLE 102 Mathematics Skills Ranked on Need for Remediation	110
Total Sample Useful Home Economics Specialties	
TOTAL 103 Mathematics Skills Ranked on Essentiality	111
TABLE 104 Mathematics Skills Ranked on Need for Remediation	112

#### BUSINESS OCCUPATIONS

Bookkeeping-Accounting	
TABLE 105 Mathematics Skills Ranked on Essentiality	113
TABLE 106 Mathematics Skills Ranked on Need for Remediation	114
Business Data Processing	
TABLE 107 Mathematics Skills Ranked on Essentiality	115
TABLE 108 Mathematics Skills Ranked on Need for Remediation	116

	PAGE
Business Education Other (N.E.C.)	
TABLE 109 Mathematics Skills Ranked on Essentiality	117
TABLE 110 Mathematics Skills Ranked on Need for Remediation	118
Data Processing	
TABLE 111 Mathematics Skills Ranked on Essentiality	119
TABLE 112 Mathematics Skills Ranked on Need for Remediation	120
General Clerical	
TABLE 113 Mathematics Skills Ranked on Essentiality	121
TABLE 114 Mathematics Skills Ranked on Need for Remediation	122
Stenographer/Secretary	
TABLE 115 Mathematics Skills Ranked on Essentiality	123
TABLE 116 Mathematics Skills Ranked on Need for Remediation	124
Total Sample Business Occupations	
TABLE 117 Mathematics Skills Ranked on Essentiality	125
TABLE 118 Mathematics Skills Ranked on Need for Remediation	126

#### DISTRIBUTIVE EDUCATION OCCUPATIONS

Distributive Education	
TABLE 119 Mathematics Skills Ranked on Essentiality	127
TABLE 120 Mathematics Skills Ranked on Need for Remediation	128
Total Sample Distributive Education Occupations	
TABLE 121 Mathematics Skills Ranked on Essentiality	129
TABLE 122 Mathematics Skills Ranked on Need for Remediation	130

## TABLE OF CONTENTS

TITLE PAGE .....	i
ABSTRACT .....	ii
PREFACE .....	iii
LIST OF TABLES .....	iv
INTRODUCTION .....	1
THE PROBLEM .....	1
OBJECTIVES .....	3
REVIEW OF RELATED LITERATURE .....	3
PROCEDURE .....	5
FINDINGS .....	6
IMPLICATIONS .....	131
REFERENCES .....	133
APPENDIX .....	134
SURVEY INSTRUMENT .....	135
LISTING OF VOCATIONAL SPECIALTIES WITH THE TOTAL NUMBER INCLUDED IN EACH SPECIALTY .....	136

## INTRODUCTION

Much is written and even more has been spoken about the relationships between "vocational" and "academic" skill acquisition at the secondary school level.

Vocational teachers along with other teaching specialists are confronted with the need to help students understand the importance of their subjects in different areas of application.

Administrators, curriculum builders, counselors, and other local educators should see to it that the inter-relationships between subjects and areas of study are investigated and evaluated. Continuing evaluation would promote curricular health, and insightful changes could be made which would bring vocational relevance and balance to all aspects of the curriculum.

For maximum curricular vigor it would be necessary to involve each teacher in the evaluative process. It would also be necessary that each teacher be encouraged to articulate his teaching with other courses, educational experiences, and vocations for which the learning is requisite.

## THE PROBLEM

Vocational teachers live daily with the problem of dovetailing related studies with the specialty training they offer. One of the critical relationships for these teachers is found in the interface between mathematics training and the vocational specialty training. The problem is further complicated by the observation that each vocational specialty seems to require its own set of associated mathematics competencies. Here is a classic example of the need for inter-disciplinary communication. Even if good communication between mathematics and vocational teachers

existed, which is apparently not the case, problems remain. Long and Herr (1973) found that while most mathematics teachers can speak with confidence of the different levels of math competence as they are reflected in the work of mathematically oriented professionals, e.g., engineers, physicists, actuaries, it is less probable that teachers of mathematics can speak with equal confidence of the mathematics functions important to skilled and craft occupations or the vocational training which is preparatory for such occupations. If mathematics teachers cannot speak with this confidence, who can? Counselors might be expected to, but they, as a group, probably display less job-related mathematics insight than mathematics teachers.

In their study of 260 vocational teachers, Long and Herr found that vocational teachers know which mathematics skills are necessary for success in their specialties and are also able to pinpoint distinct math skill deficiencies in students entering the vocational program. These teachers, however, are generally not available to students when they are considering secondary vocational programs because they are housed in high schools or in Area Vocational Schools (AVTS).

Students who choose to enter vocational preparatory programs then may be informationally disadvantaged. That is, they probably do not know which mathematics (and other) skills have relevance to their vocational goals. It seems then, that the chasm between related studies in mathematics and vocational specialty training is not effectively being bridged.

In summary, mathematics teachers and counselors probably cannot readily identify the mathematics functions required in each vocational specialty. Basic mathematics training is generally not offered in the Area Vocational Technical School. Inter-specialty communication between mathematics and vocational teachers is stilted at best. Vocational teachers are generally not available for discussion with students when they are choosing vocational training specialties.

Given these situations, the need still exists for mathematics competence in vocational specialty training.

## OBJECTIVES

Considering the need for appropriate guidance and curricular relevance in vocational education, this study was designed to provide information which would promote satisfaction of some of the unmet demands regarding mathematics competency needs in vocational specialty training at the secondary school level.

The specific objectives were:

1. To determine from a large sample of vocational teachers which basic mathematics skills are necessary for success in various secondary vocational programs.
2. To determine which basic mathematics skills need most remedial attention for students entering secondary vocational programs.

## REVIEW OF RELATED LITERATURE

The materials referenced here are not an encyclopedic review of all written or spoken on the matter. The review is merely an extraction and synthesization of the most recent research and rhetoric related to basic skill training in vocational educational endeavors. Not one piece of literature can be cited which denied the critical relationship between basic general education and vocational specialty training. Conversely, the need for and use of information of the kind collected in this study was amply supported.

In discussing curricular concepts in specialty training activities Kemp (1966) emphasized that basic skill education should be closely tied with vocational offerings to make both more meaningful to the student. She clearly documented the utility of

such endeavors in programs designed for children plagued with various kinds and degrees of disadvantage.

Osipow (1969) felt that efforts must be made to show how skills acquired in school have utility in the world of work.

In stressing the need for the educational system to assume responsibility for preparing every student to move on to his next educational or occupational step, Venn (1964) stated that no person can be successful in occupational education unless he has the basic tool skills of reading, writing, listening, and computing. He further stated that "the separation of occupational education from general education at any level increases the possibility of limiting the individual's future development because of lack of related knowledge and general education (p. 169)."

Marland (1971) in supporting career education for elementary and secondary students cited a need for the structuring of basic subjects, grades one through twelve, around the theme of career development and the requirements of the world of work.

Rhodes (1969), the former governor of Ohio, spoke directly to the mathematics issue.

Ask any carpenter to quote for you the Pythagorean theorem. He will probably assume that you have lost your marbles, and he may disclaim any understanding of such an animal. This disclaimer will make the math teacher feel a bit superior and provide him with the opportunity to display his knowledge. If, however, you should ask that same carpenter if he could lay out a right angle with the batter boards for the contractor to start construction of a building, he would immediately say, "Yes, I can do that" - without understanding that he was using the Pythagorean theorem. He probably cannot quote the theorem; and he probably cannot prove the theorem; however, he can use the theorem for a useful purpose in relationship to his work. Even an average young person can be taught the functions of mathematics and the principles of science that he will need in his occupation, if these are taught in relation to that occupation and in relation to the real problems and activities in which he has an opportunity to put the theory to work (p. 25).



Testimony to the importance of mathematics skills in vocational education is found in the literature as evidenced in the work of Schill and Arnold (1965) on curriculum content in six technologies and in the work of Schill and Barlow (1962) concerning the role of mathematics in electrical and electronics technology. In a study of technicians Laws (1967) found that the mathematical ability of the individual often determines his pay-roll job assignment, that all technicians need a common core of basic skills in mathematics, and that the math needs of tomorrow's worker may be different from those of today. Kapes (1971) found all GATB scores to be positively related to vocational students' grade point average in school work. The aptitudes showing the highest relationships were found to be numerical and verbal. Of these the numerical aptitude was highest in importance. In a pilot study prior to the one reported here Long and Herr (1973) found that there is a mathematics base which underlies all vocational training and that the required mathematics functions differ across vocational education specialties.

The review of the literature lends emphasis and support to the concepts that the definition of and training in basic skills are very important to successful vocational education and occupational competency.

#### PROCEDURES

In this study an optical scanning survey form listing 66 basic mathematics skills was distributed to all secondary vocational teachers in Pennsylvania.

The 66 skills used were obtained from standard mathematics or remedial texts and were reviewed for appropriateness by selected teacher educators. The forms were not sent to the teacher directly. They were sent to Directors of Area Vocational Technical Schools or to the principals of schools housing vocational programs. These individuals were asked to distribute and collect the forms and then return

them to the investigators in pre-paid mailers. The vocational programs were identified from the Pennsylvania Vocational Education Directory, Secondary, Part I, Programs/Enrollments, Bureau of Vocational Technical and Continuing Education, Department of Education, Harrisburg, Pennsylvania, 1971.

The teacher respondents were asked to identify the skills that were essential for success in their vocational specialty and then to identify those skills lacked by the typical or average student enrolling in their specialty.

A total of 4,839 forms were sent out. Of these, 3,467 or 71.6 percent were returned. Of those returned, the data from 3,404 or 70% of the total mailed were included in the study. Sixty three (63) forms were not included in the analysis for various reasons, e.g., mutilation, improper marking or non-completion of the form.

Following collection of the instruments, they were coded, processed and tabulated. Processing included optical scanning to punched cards to computer analysis and print out. Computer analysis was done using a Frequency Analysis of Multiple Choices Program (FRANM) available from the Computation Center of the Pennsylvania State University. Processing yielded the data as reported in TABLES 1 to 122. In collecting the data, teachers were additionally asked to identify their major teaching specialty and to mark a scale indicating the number of credits they themselves had earned beyond high school. No other information was collected. All respondents remained completely anonymous.

## FINDINGS

The findings are reported in TABLES 1 through 122. For each vocational specialty one finds two tables - one ranks the basic mathematics skills according to essentiality for success in the specialty; the second ranks the skills on teacher

perceived need for remediation of the skills as determined from the number of teachers who felt that the skill was lacking in the typical student entering the specialty. Tables yield, for each skill, the rank earned, the number of teachers responding to the item, and the percentage of the group who established the rank reported.

The skills in each table are ranked according to the percent of the teachers who responded to each individual math skill item. The percentage is not based on the total number of teachers in the specialty who completed the survey form.

For example, 20 teachers representing one vocational specialty may have completed the survey form. Only 19 teachers may have responded to a particular item, and of those 19, only 18 may have indicated that the skill was essential (or lacking). The percentage and ranking for the skill as treated in the FRANM Program was computed using the ratio  $\frac{18}{19}$  rather than  $\frac{18}{20}$ .

One must continually keep in mind that all teachers did not respond to each item. Therefore, the percentage and ranking reported for each skill reflects only the number of teachers who chose to respond to the item, not to the number of teachers who completed the survey form.

There is not perfect correspondence between the tables. On the first table for each specialty, the skills are ranked on the basis of need in the program. The second table ranks the skills on the degree to which teachers felt them to be missing in newly enrolling students. One must still compare the two tables to determine if a skill in need of remediation is in fact a skill highly essential for success in the specialty.

Following the two tables for each individual specialty in each division, i.e., Health Occupations, Business Occupations, etc., two additional tables are

provided. One reports the mathematics skill pooled ranking based on need as perceived by teachers of all specialties within the division. The second table shows the pooled ranking of the skills based on the teacher perceived need for remediation in newly enrolling students.

The hierarchy of skills ranked as essential or lacking shows much variation between specialties. Cumulative evidence, however, suggests a need for remediation in all basic mathematics skills, that is, each skill is somewhere found high in either or both the essentiality or need for remediation rankings. Curricular implications are clear.

TABLE 1  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AIR CONDITIONING AND HEATING TEACHERS WHO FELT  
THAT THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	94.7	18	Multiplication, whole numbers
2	94.7	18	Subtraction, whole numbers
2	94.7	18	Addition, whole numbers
4	94.4	17	Division, whole numbers
5	84.2	16	Reading a rule
6	83.3	15	Averages
7.5	78.9	15	Liquid measure
7.5	78.9	15	Meaning of percentage
9	76.5	13	Reading large numbers
10.5	73.7	14	Temperature conversion
10.5	73.7	14	Reading, writing decimals
13	72.2	13	Volume of cylinder
13	72.2	13	Finding percent of a number
13	72.2	13	Rounding off decimals
16.5	68.4	13	Reducing fractions to lowest terms
16.5	68.4	13	Subtraction, fractions
16.5	68.4	13	Addition, fractions
16.5	68.4	13	Area of square
20	66.7	12	Addition, mixed numbers
20	66.7	12	Changing decimals to percents
20	66.7	12	Rounding numbers
22	63.2	12	Area of circle
25	61.1	11	Changing decimals to common fractions
25	61.1	11	Changing percent to decimals
25	61.1	11	Subtraction of decimals
25	61.1	11	Addition of decimals
25	61.1	11	Subtraction, mixed numbers
29.5	57.9	11	Multiplication, mixed numbers
29.5	57.9	11	Area of rectangle
29.5	57.9	11	Micrometer reading
29.5	57.9	11	Division, mixed numbers
32	55.6	10	Multiplication of decimals
33	52.9	9	Changing common fractions to decimals
34.5	52.6	10	Multiplication, fractions
34.5	52.6	10	Division, fractions
37.5	50	9	Division of decimals
37.5	50	9	Decimal equivalents
37.5	50	9	Reducing mixed numbers to simplest form
37.5	50	9	Multiplying whole numbers and decimals by 10,100,etc.
40.5	47.4	9	Measuring angles
40.5	47.4	9	Area of circle using $A=\pi r^2$
43.5	44.4	8	Ratio and proportion
43.5	44.4	8	Dividing whole numbers and decimals by 10,100,etc.
43.5	44.4	8	Changing common fractions to percents
43.5	44.4	8	Changing percents to common fractions
46	42.1	8	Circumference using $C=\pi d=2\pi r$
47.5	42.1	8	Squaring a number
47.5	42.1	8	Comparing fractions
49	41.2	7	Volume of rectangular solid
51.5	38.9	7	Area of triangle
51.5	38.9	7	Finding a number when a percent of it is known
51.5	38.9	7	Finding what percent one number is of another
51.5	38.9	7	Finding what part one number is of another
55	36.8	7	Square root
55	36.8	7	Simple algebraic equation with one unknown
55	36.8	7	Using pi $\pi$
57	35.3	6	Volume of cube
58.5	33.3	6	Area of parallelogram
58.5	33.3	6	Improper fractions, mixed numbers
60	31.6	6	Finding length of unknown side of right triangle
61.5	27.8	5	Finding a number when a fractional part of it is known
61.5	27.8	5	Acute and obtuse angles
63.5	22.2	14	Area of trapezoid
63.5	22.2	4	Volume of cone
65.5	16.7	3	Volume of sphere
65.5	16.7	3	Volume of pyramid

TABLE 2  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING AIR CONDITIONING AND HEATING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	89.5	17	Micrometer reading
2.5	82.4	14	Finding length of unknown side of right triangle
2.5	82.4	14	Volume of cylinder
4.4	81.3	13	Volume of rectangular solid
4.4	81.3	13	Finding what percent one number is of another
7.5	77.8	14	Simple algebraic equation with one unknown
7.5	77.8	14	Using pi $\pi$
7.5	77.8	14	Circumference using $C = \pi d = 2\pi r$
7.5	77.8	14	Area of circle using $A = \pi r^2$
10.5	76.5	13	Ratio and proportion
10.5	76.5	13	Division, mixed numbers
13	75	12	Acute and obtuse angles
13	75	12	Finding a number when a percent of it is known
13	75	12	Volume of cube
16	73.3	11	Volume of sphere
16	73.3	11	Volume of cone
16	73.3	11	Volume of pyramid
18.5	72.2	13	Multiplication, fractions
18.5	72.2	13	Division, fractions
20.5	70.6	12	Square root
20.5	70.6	12	Changing decimals to common fractions
23.5	68.8	11	Finding a number when a fractional part of it is known
23.5	68.8	11	Comparing fractions
23.5	68.8	11	Changing common fractions to decimals
23.5	68.8	11	Reducing mixed numbers to simplest form
26.5	68.4	13	Temperature conversion
26.5	68.4	13	Reading, writing decimals
28.5	66.7	12	Addition, fractions
28.5	66.7	12	Subtraction, fractions
33.5	64.7	11	Squaring a number
33.5	64.7	11	Decimal equivalents
33.5	64.7	11	Measuring angles
33.5	64.7	11	Area of circle
33.5	64.7	11	Changing percent to decimals
33.5	64.7	11	Changing decimals to percents
33.5	64.7	11	Finding percent of a number
33.5	64.7	11	Multiplication, mixed numbers
38.5	63.2	12	Liquid measure
38.5	63.2	12	Reading a rule
40	60	9	Area of parallelogram
42.5	62.5	10	Subtraction, mixed numbers
42.5	62.5	10	Finding what part one number is of another
42.5	62.5	10	Changing percents to common fractions
42.5	62.5	10	Changing common fractions to percents
45.5	61.1	11	Reducing fractions to lowest terms
45.5	61.1	11	Meaning of percentage
47	60	9	Improper fractions, mixed numbers
48	58.8	10	Rounding off decimals
49	56.3	9	Addition, mixed numbers
50.5	53.5	8	Area of triangle
50.5	53.3	8	Area of trapezoid
52	52.9	9	Division of decimals
53.5	52.6	10	Area of rectangle
53.5	52.6	10	Area of square
55.5	50	9	Multiplication of decimals
55.5	50	9	Addition of decimals
57.5	47.1	8	Dividing whole numbers and decimals by 10,100,etc.
57.5	47.1	8	Subtraction of decimals
59	44.4	8	Multiplying whole numbers and decimals by 10,100,etc.
60	42.1	8	Division, whole numbers
61	38.9	7	Averages
62	31.6	6	Multiplication, whole numbers
63	31.3	5	Rounding numbers
64	17.6	3	Addition, whole numbers
65	16.7	3	Subtraction, whole numbers
66	13.3	2	Reading large numbers

TABLE 3

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF APPLIANCE REPAIR TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.8	100	29	Subtraction, whole numbers
1.5	100	29	Addition, whole numbers
4.5	96.6	28	Multiplication, whole numbers
4.5	96.6	28	Addition of decimals
4.5	96.6	28	Division, whole numbers
4.5	96.6	28	Reading, writing decimals
8.5	93.1	27	Dividing whole numbers and decimals by 10, 100, etc.
8.5	93.1	27	Subtraction of decimals
8.5	93.1	27	Reading a rule
8.5	93.1	27	Multiplying whole numbers and decimals by 10, 100, etc.
16	89.7	26	Subtraction, mixed numbers
16	89.7	26	Multiplication, mixed numbers
16	89.7	26	Subtraction, fractions
16	89.7	26	Addition, mixed numbers
16	89.7	26	Addition, fractions
16	89.7	26	Meaning of percentage
16	89.7	26	Division of decimals
16	89.7	26	Division, fractions
16	89.7	26	Improper fractions, mixed numbers
16	89.7	26	Multiplication of decimals
16	89.7	26	Decimal equivalents
25.5	86.2	25	Changing decimals to per cents
25.5	86.2	25	Changing common fractions to decimals
25.5	86.2	25	Reducing mixed numbers to simplest form
25.5	86.2	25	Changing per cent to decimals
25.5	86.2	25	Reading large numbers
25.5	86.2	25	Division, mixed numbers
25.5	86.2	25	Rounding off decimals
25.5	86.2	25	Multiplication, fractions
32	82.8	24	Temperature conversion
32	82.8	24	Liquid measure
32	82.8	24	Rounding numbers
32	82.8	24	Reducing fractions to lowest terms
32	82.8	24	Finding per cent of a number
35	82.1	23	Averages
36	79.3	23	Changing decimals to common fractions
37	75.9	22	Squaring a number
38.5	69	20	Changing common fractions to per cents
38.5	69	20	Comparing fractions
40	67.9	10	Simple algebraic equation with one unknown
41	66.7	18	Finding a number when a fractional part of it is known
43	65.5	19	Changing per cents to common fractions
43	65.5	19	Square root
43	65.5	19	Micrometer reading
45.5	62.1	18	Finding what part one number is of another
45.5	62.1	18	Finding what per cent one number is of another
47	58.6	17	Finding a number when a per cent of it is known
48	55.2	16	Ratio and proportion
49	51.7	15	Area of square
50.5	48.3	14	Volume of cube
50.5	48.3	14	Area of rectangle
52	44.8	13	Using $\pi$
53.5	41.4	12	Volume of cylinder
53.5	41.4	12	Volume of rectangular
55	39.3	11	Measuring angles
56	37.9	11	Circumference using $C = \pi d = 2\pi r$
57.5	35.7	10	Area of circle
57.5	35.7	10	Area of parallelogram
59	31	9	Area of circle using $A = \pi r^2$
60	27.6	8	Area of triangle
61	25	7	Volume of sphere
62	18.5	5	Finding length of unknown side of right triangle
63	17.9	5	Area of trapezoid
65	14.3	4	Acute and obtuse angles
65	14.3	4	Volume of cone
65	14.3	4	Volume of pyramid

TABLE 4

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING APPLIANCE REPAIR STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	85.7	24	Decimal equivalents
1.5	85.7	24	Square root
4	82.1	23	Changing decimals to common fractions
4	82.1	23	Improper fractions, mixed numbers
4	82.1	23	Temperature conversion
7	78.6	22	Division, mixed numbers
7	78.6	22	Simple algebraic equation with one unknown
7	78.6	22	Changing decimals to per cents
9.5	76.9	20	Finding a number when a fractional part of it is known
9.5	76.9	20	Volume of sphere
14	75	21	Changing common fractions to per cents
14	75	21	Finding per cent of a number
14	75	21	Finding what per cent one number is of another
14	75	21	Finding a number when a per cent of it is known
14	75	21	Changing common fractions to decimals
14	75	21	Changing per cent to decimals
14	74.1	20	Volume of cylinder
19.5	73.1	19	Volume of cone
19.5	73.1	19	Volume of pyramid
19.5	73.1	19	Area of triangle
19.5	73.1	19	Squaring a number
22	72.4	21	Subtraction, fractions
23	72	18	Area of parallelogram
26.5	71.4	20	Finding what part one number is of another
26.5	71.4	20	Subtraction, mixed numbers
26.5	71.4	20	Multiplication, mixed numbers
26.5	71.4	20	Reducing mixed numbers to simplest form
26.5	71.4	20	Comparing fractions
26.5	71.4	20	Division of decimals
30.5	70.4	19	Reading a rule
30.5	70.4	19	Micrometer reading
32.5	69.2	18	Measuring angles
32.5	69.2	18	Volume of rectangular solid
34	69	20	Division, fractions
35.5	68	17	Area of trapezoid
35.5	68	17	Area of circle
39	67.9	19	Meaning of percentage
39	67.9	19	Multiplication of decimals
39	67.9	19	Addition, mixed numbers
39	67.9	19	Changing per cents to common fractions
39	67.9	19	Liquid measure
43	66.7	18	Reducing fractions to lowest terms
43	66.7	18	Circumference using $C = \pi d = 2\pi r$
43	66.7	18	Area of circle using $A = \pi r^2$
45.5	65.5	19	Addition, fractions
45.5	65.5	19	Multiplication, fractions
47	64.3	18	Reading, writing decimals
48	64	16	Acute and obtuse angles
50	63	17	Area of rectangle
50	63	17	Using pi $\pi$
50	63	17	Ratio and proportion
52.5	61.5	16	Volume of cube
52.5	61.5	16	Area of square
54	60.9	14	Finding length of unknown side of right triangle
55	55.6	15	Dividing whole numbers and decimals by 10, 100, etc.
56.5	53.6	15	Addition of decimals
56.5	53.6	15	Subtraction of decimals
58	51.9	14	Averages
59	50	14	Rounding off decimals
60	48.1	13	Multiplying whole numbers and decimals by 10, 100, etc.
61	46.4	13	Rounding numbers
62	44.4	12	Division, whole numbers
63	32.1	9	Multiplication, whole numbers
64	25	7	Reading large numbers
65.5	17.9	5	Addition, whole numbers
65.5	17.9	5	Subtraction, whole numbers



TABLE 5  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AUTOMOTIVE BODY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	93.9	62	Addition, whole numbers
2	92.4	61	Subtraction, whole numbers
3	90.9	60	Multiplication, whole numbers
4	89.1	57	Reading a rule
5	86.4	57	Division, whole numbers
6	78.1	50	Meaning of percentage
7	77.3	57	Liquid measure
8	75	48	Averages
10	73.8	48	Addition, mixed numbers
10	73.8	48	Reading, writing decimals
10	73.8	48	Ratio and proportion
12	70.8	46	Addition, fractions
13.5	69.2	45	Subtraction, fractions
13.5	69.2	45	Subtraction, mixed numbers
15	66.2	43	Reducing fractions to lowest terms
17	64.1	41	Addition of decimals
17	64.1	41	Reading large numbers
17	64.1	41	Finding per cent of a number
19	63.5	40	Subtraction of decimals
20.5	62.5	40	Decimal equivalents
20.5	62.5	40	Comparing fractions
22	61.5	40	Rounding off decimals
23.5	59.4	38	Rounding numbers
25.5	59.4	38	Changing decimals to common fractions
25	58.7	37	Multiplication, mixed numbers
26	56.3	36	Changing common fractions to decimals
27	55.6	35	Changing per cent to decimals
28	54.8	34	Multiplication of decimals
29	55.4	36	Multiplication, fractions
30.5	54.7	35	Division, mixed numbers
30.5	54.7	35	Reducing mixed numbers to simplest form
32	54	34	Changing decimals to per cents
33.5	53.8	35	Division, fractions
33.5	53.8	35	Measuring angles
35	52.5	32	Changing common fractions to per cents
36	51.6	32	Division of decimals
37	50.8	32	Micrometer reading
38	50	32	Improper fractions, mixed numbers
39	47.5	29	Changing per cents to common fractions
40	45.9	28	Dividing whole numbers and decimals by 10, 100, etc.
41	45.2	28	Multiplying whole numbers and decimals by 10, 100, etc.
42	42.9	27	Volume of cylinder
43	41.5	27	Finding what per cent one number is of another
44	40.3	25	Finding what part one number is of another
45	37.5	24	Area of circle
46	36.5	23	Finding a number when a per cent of it is known
47	35.9	23	Temperature conversion
48	35.4	23	Area of square
49	31.3	20	Using pi $\pi$
50	30.8	20	Area of rectangle
51	28.6	18	Circumference using $C = \pi d = 2\pi r$
52	27.4	17	Finding a number when a fractional part of it is known
53	26.6	17	Area of circle using $A = \pi r^2$
54	21	13	Squaring a number
55	12.9	18	Square root
56	18.8	12	Acute and obtuse angles
57	18.5	12	Area of triangle
58.5	17.5	11	Simple algebraic equation with one unknown
58.5	17.5	11	Volume of rectangular solid
60	15.9	10	Volume of cube
61	14.5	9	Finding length of unknown side of right triangle
62	12.5	8	Area of parallelogram
63	11.1	7	Area of trapezoid
64.5	7.9	5	Volume of sphere
64.5	7.9	5	Volume of cone
66	6.3	4	Volume of pyramid

3

TABLE 6  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING AUTOMOTIVE BODY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	87.7	50	Ratio and proportion
2	82	41	Volume of cylinder
3	81.6	40	Area of circle using $A=\pi r^2$
4	81.3	39	Circumference using $C=\pi d=2\pi r$
5	81.1	43	Micrometer reading
6	80.4	45	Division, fractions
7	80	44	Improper fractions, mixed numbers
8	79.6	39	Temperature conversion
9	79.2	38	Volume of cube
10	78.7	37	Volume of rectangular solid
11	78.6	44	Multiplication, fractions
12	78.4	40	Area of circle
13	77.8	42	Measuring angles
14	77.4	41	Decimal equivalents
15	77.2	44	Changing common fractions to decimals
17	76.6	36	Volume of cone
17	76.6	36	Volume of pyramid
17	76.6	36	Simple algebraic equation with one unknown
19	76	38	Finding a number when a fractional part of it is known
20	75.9	44	Reading, writing decimals
21.5	75.5	40	Changing decimals to common fractions
21.5	75.5	37	Area of trapezoid
23.5	74.5	38	Using pi $\pi$
23.5	74.5	41	Reducing mixed numbers to simplest form
25.5	74	37	Finding what part one number is of another
25.5	74	37	Finding length of unknown side of right triangle
27	73.5	36	Area of parallelogram
28	73.1	38	Changing decimals to per cents
29.5	72.9	43	Subtraction, fractions
29.5	72.9	35	Volume of sphere
31	72.5	37	Area of triangle
32	72.2	39	Division, mixed numbers
33	72	36	Acute and obtuse angles
34	71.9	41	Multiplication, mixed numbers
36	71.4	40	Liquid measure
36	71.4	35	Finding a number when a per cent of it is known
36	71.4	40	Reading a rule
39	71.2	37	Changing per cents to common fractions
39	71.2	37	Changing common fractions to per cents
39	71.2	37	Finding per cent of a number
41	70.7	41	Reducing fractions to lowest terms
42	70.6	36	Finding what per cent one number is of another
43	70.2	40	Subtraction, mixed numbers
44.5	69.8	37	Changing per cent to decimals
44.5	69.8	37	Division of decimals
46	69.5	41	Addition, fractions
47	69.1	38	Comparing fractions
48	69	40	Addition, mixed numbers
49.5	68.6	35	Area of rectangle
49.5	68.6	35	Area of square
51	68.1	32	Square root
52	67.8	40	Averages
53.5	66.7	38	Addition of decimals
53.5	66.7	36	Multiplication of decimals
55	66	35	Meaning of percentage
56	63.8	37	Rounding off decimals
57	63.3	31	Squaring a number
58	62.5	35	Subtraction of decimals
59.5	55.8	29	Multiplying whole numbers and decimals by 10,100,etc.
59.5	55.8	29	Dividing whole numbers and decimals by 10,100,etc.
61	46.9	30	Division, whole numbers
62	43.8	28	Multiplication, whole numbers
63	42.9	24	Rounding numbers
64	38.2	21	Reading large numbers
65	34.9	22	Subtraction, whole numbers
66	34.4	22	Addition, whole numbers

TABLE 7  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AUTOMOTIVE MECHANIC TEACHERS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	96.6	173	Subtraction, whole numbers
1.5	96.6	173	Addition, whole numbers
3	96	170	Liquid measure
4	94.4	167	Division, whole numbers
5	93.8	167	Multiplication, whole numbers
6	91.6	168	Addition, fractions
7	83.1	147	Meaning of percentage
8	85.5	153	Subtraction, fractions
9	79.3	142	Addition, mixed numbers
10	78.1	139	Division, fractions
11	75.8	135	Multiplication, fractions
12	75.4	135	Subtraction, mixed numbers
13	75.1	133	Reducing fractions to lowest terms
14	69.3	122	Averages
15	66.9	119	Reading a rule
16	63.5	113	Division, mixed numbers
17	62.9	112	Multiplication, mixed numbers
18	61.8	110	Finding percent of a number
19	61.5	110	Rounding numbers
20	60.1	107	Improper fractions, mixed numbers
21	59.8	107	Reducing mixed numbers to simplest form
22	53.7	95	Reading, writing decimals
23	53.4	95	Comparing fractions
24	50.6	88	Ratio and proportion
25	50	89	Addition of decimals
26	48.3	86	Subtraction of decimals
27	47.5	84	Changing percent to decimals
28	46.3	82	Rounding off decimals
29	46.1	82	Finding what percent one number is of another
30	45.8	81	Division of decimals
32	45.5	81	Multiplying whole numbers and decimals by 10,100,etc.
32	45.5	81	Changing decimals to percents
32	45.5	81	Changing percents to common fractions
34	45.2	80	Changing common fractions to percents
35	44.6	79	Area of rectangle
36	44.4	79	Multiplication of decimals
37.5	44.1	78	Area of square
37.5	44.1	78	Dividing whole numbers and decimals by 10,100,etc.
39	43.2	76	Changing common fractions to decimals
40	41	73	Reading large numbers
41	39.3	70	Finding what part one number is of another
42	34.5	61	Changing decimals to common fractions
43	34.3	61	Finding a number when a percent of it is known
44	33.7	60	Decimal equivalents
45	31.8	56	Finding a number when a fractional part of it is known
46	29.7	52	Temperature conversion
47	20	35	Simple algebraic equation with one unknown
48	16.7	29	Measuring angles
49	15.9	28	Area of circle
50	11.4	20	Squaring a number
51	9.7	17	Area of triangle
52	8.5	15	Volume of cylinder
53.5	8	14	Area of circle using $A=\pi r^2$
53.5	8	14	Volume of rectangular solid
55	7.4	13	Volume of cube
56.5	6.8	12	Acute and obtuse angles
56.5	6.8	12	Circumference using $C=\pi d=2\pi r$
58.5	6.3	11	Square root
58.5	6.3	11	Area of parallelogram
60	4.5	8	Using pi $\pi$
61	4	7	Finding length of unknown side of right triangle
62.5	2.8	5	Area of trapezoid
62.5	2.8	5	Volume of sphere
64.5	2.3	4	Micrometer reading
64.5	2.3	4	Volume of cone
66	1.7	3	Volume of pyramid

TABLE 8  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING AUTOMOTIVE MECHANIC STUDENT

RANK	PERCENT	NUMBER	SKILL
1	86.1	62	Ratio and proportion
2	84.4	65	Micrometer reading
3	83.1	59	Volume of cylinder
5	80.8	59	Reducing fractions to lowest terms
5	80.3	61	Changing common fractions to decimals
5	80.3	53	Temperature conversion
7	77	57	Decimal equivalents
8	76	57	Reading, writing decimals
9	75.8	50	Area of circle using $A=\pi r^2$
10	74.6	50	Circumference using $C=\pi d=2\pi r$
11	74.3	55	Comparing fractions
12	74	57	Reading a rule
13	73.6	53	Changing decimals to common fractions
14	73.1	49	Area of circle
15	73	54	Subtraction, fractions
16	72.9	51	Reducing mixed numbers to simplest form
17	72	54	Rounding off decimals
18	71.8	51	Improper fractions, mixed numbers
19.5	71	49	Finding what per cent one number is of another
19.5	71	44	Finding length of unknown side of right triangle
21	70.7	53	Addition, fractions
22.5	70.6	48	Changing decimals to per cents
22.5	70.6	48	Measuring angles
24	70.1	47	Changing common fractions to per cents
25	69.8	44	Simple algebraic equation with one unknown
26.5	69.4	50	Multiplication, fractions
26.5	69.4	50	Division, fractions
28.5	69.1	47	Changing per cents to common fractions
28.5	69.1	47	Changing per cent to decimals
30	69	49	Finding per cent of a number
31	68.8	44	Volume of cube
32	68.4	42	Acute and obtuse angles
33	68.3	41	Area of trapezoid
34	67.7	44	Finding a number when a fractional part of it is known
36	67.2	41	Volume of pyramid
36	67.2	41	Volume of sphere
36	67.2	43	Finding what part one number is of another
38	67.1	47	Addition, mixed numbers
39	66.7	40	Volume of cone
40	65.6	40	Volume of rectangular solid
41	65.2	45	Subtraction, mixed numbers
42.5	64.7	44	Division, mixed numbers
42.5	64.7	44	Using pi $\pi$
44	64.6	42	Finding a number when a per cent of it is known
45	64.2	43	Multiplication, mixed numbers
46	63.5	47	Meaning of percentage
47	62.9	39	Area of triangle
48.5	62.5	40	Squaring a number
48.5	62.5	45	Multiplication of decimals
50	62.3	38	Square root
51	61.4	43	Division of decimals
52.5	61.3	38	Area of rectangle
52.5	61.3	38	Area of parallelogram
54	59.7	43	Averages
55	59.5	44	Liquid measure
56	59.2	45	Addition of decimals
57	58.7	44	Subtraction of decimals
58	57.8	37	Area of square
59	54.9	39	Dividing whole numbers and decimals by 10, 100, etc.
60	53.4	39	Multiplying whole numbers and decimals by 10, 100, etc.
61	49.3	37	Division, whole numbers
62	47.1	32	Rounding numbers
63	46.5	33	Reading large numbers
64	44.2	34	Multiplication, whole numbers
65	37.7	29	Addition, whole numbers
66	36	30	Subtraction, whole numbers

TABLE 9  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF BUILDING CONSTRUCTION MAINTENANCE TEACHERS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
3.5	100	30	Addition, whole numbers
3.5	100	30	Subtraction, whole numbers
3.5	100	30	Multiplication, whole numbers
3.5	100	30	Division, whole numbers
3.5	100	30	Area of square
3.5	100	30	Reading a rule
7.5	96.7	29	Addition, fractions
7.5	96.7	29	Area of rectangle
9	96.6	28	Rounding numbers
10	93.3	28	Subtraction, fractions
11.5	93.1	27	Addition, mixed numbers
11.5	93.1	27	Subtraction, mixed numbers
13.5	90	27	Reducing fractions to lowest terms
13.5	90	27	Reading large numbers
16.5	86.7	26	Area of circle
16.5	86.7	26	Reading, writing decimals
16.5	86.7	26	Multiplication, fractions
16.5	86.7	26	Division, fractions
19.5	83.3	25	Volume of cube
19.5	83.3	25	Area of triangle
21	82.8	24	Multiplication, mixed numbers
22	82.1	23	Division, mixed numbers
24	80	24	Measuring angles
24	80	24	Rounding off decimals
24	80	24	Improper fractions, mixed numbers
26.5	73.3	22	Decimal equivalents
26.5	73.3	22	Addition of decimals
30	76.7	23	Averages
30	76.7	23	Reducing mixed numbers to simplest form
30	76.7	23	Changing common fractions to decimals
30	76.7	23	Volume of rectangular solid
30	76.7	23	Meaning of percentage
33	75.9	22	Area of circle using $A = \pi r^2$
34.5	73.3	22	Multiplying whole numbers and decimals by 10,100,etc.
34.5	73.3	22	Volume of cylinder
37.5	70	21	Changing decimals to common fractions
37.5	70	21	Dividing whole numbers and decimals by 10, 100, etc.
37.5	70	21	Subtraction of decimals
37.5	70	21	Liquid measure
40.5	66.7	20	Finding per cent of a number
40.5	66.7	20	Finding what per cent one number is of another
42	65.5	19	Circumference using $C = \pi d = 2\pi r$
45	63.3	19	Finding length of unknown side of right triangle
45	63.3	19	Using pi $\pi$
45	63.3	19	Multiplication of decimals
45	63.3	19	Division of decimals
45	63.3	19	Ratio and proportion
45	63.3	19	Comparing fractions
45	63.3	19	Area of parallelogram
50	60	18	Finding a number when a per cent of it is known
50	60	18	Squaring a number
50	60	18	Square root
52	58.6	17	Finding a number when a fractional part of it is known
55.5	56.7	17	Finding what part one number is of another
55.5	56.7	17	Volume of sphere
55.5	56.7	17	Volume of cone
55.5	56.7	17	Volume of pyramid
55.5	56.7	17	Micrometer reading
55.5	56.7	17	Acute and obtuse angles
60	53.3	16	Simple algebraic equation with one unknown
60	53.3	16	Changing per cents to common fractions
60	53.3	16	Changing common fractions to per cents
63.5	50	15	Area of trapezoid
63.5	50	15	Changing decimals to per cents
65	46.7	14	Changing per cent to decimals
66	36.7	11	Temperature conversion

TABLE 10  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING BUILDING CONSTRUCTION MAINTENANCE STUDENT

RANK	PERCENT	NUMBER	SKILL
1	92.6	25	Volume of cylinder
2	92.3	24	Volume of sphere
3	91.7	22	Temperature conversion
6	88.5	23	Volume of cone
6	88.5	23	Volume of pyramid
6	88.5	23	Simple algebraic equation with one unknown
6	88.5	23	Ratio and proportion
6	88.5	23	Acute and obtuse angles
9.5	88	22	Area of trapezoid
9.5	88	22	Micrometer reading
11	86.2	25	Division, mixed numbers
14	84.6	22	$C = \pi d = 2\pi r$
14	84.6	22	Changing per cents to common fractions
14	84.6	22	Changing common fractions to per cents
14	84.6	22	Finding length of unknown side of right triangle
14	84.6	22	Measuring angles
18	83.3	25	Improper fractions, mixed numbers
18	83.3	25	Reducing mixed numbers to simplest form
18	83.3	25	Division, fractions
20	82.8	24	Changing common fractions to decimals
22	82.1	23	Area of triangle
22	82.1	23	Changing decimals to per cents
22	82.1	23	Changing decimals to common fractions
24	81.5	22	Square root
25	80	24	Comparing fractions
26	79.3	23	Multiplication, mixed numbers
27.5	78.6	22	Changing per cent to decimals
27.5	78.6	22	Decimal equivalents
29.5	77.8	21	Area of circle
29.5	77.8	21	Area of circle using $A = \pi r^2$
31.5	76.9	20	Finding a number when a fractional part of it is known
31.5	76.9	20	Area of parallelogram
34	76.7	23	Reducing fractions to lowest terms
34	76.7	23	Subtraction, fractions
34	76.7	23	Multiplication, fractions
36	76	19	Liquid measure
37	75.9	22	Subtraction, mixed numbers
38	74.1	20	Finding per cent of a number
40.5	73.1	19	Using pi $\pi$
40.5	73.1	19	Finding what per cent one number is of another
40.5	73.1	19	Finding a number when a per cent of it is known
40.5	73.1	19	Finding what part one number is of another
43.5	72.4	21	Addition, mixed numbers
43.5	72.4	21	Division of decimals
45	70.4	19	Squaring a number
46.5	70	21	Reading, writing decimals
46.5	70	21	Addition, fractions
48	67.9	19	Volume of rectangular solid
50	69	20	Multiplication of decimals
50	69	20	Reading a rule
50	69	20	Volume of cube
52.5	65.5	19	Rounding off decimals
52.5	65.5	19	Averages
54	59.3	16	Meaning of percentage
55	55.2	16	Subtraction of decimals
56	53.6	15	Dividing whole numbers and decimals by 10,100,etc.
57	51.7	15	Addition of decimals
58	50	14	Rounding numbers
59	46.4	13	Area of rectangle
60	44.8	13	Area of square
61.5	43.3	13	Multiplication, whole numbers
61.5	43.3	13	Division, whole numbers
63	42.9	12	Multiplying whole numbers and decimals by 10,100,etc.
64.5	26.7	8	Addition, whole numbers
64.5	26.7	8	Subtraction, whole numbers
66	30	9	Reading large numbers

TABLE 11  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CARPENTRY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
5.5	100	49	Reading a rule
5.5	100	49	Division, whole numbers
5.5	100	48	Multiplication, whole numbers
5.5	100	48	Reducing fractions to lowest terms
5.5	100	48	Subtraction, whole numbers
5.5	100	48	Addition, whole numbers
5.5	100	48	Subtraction, mixed numbers
5.5	100	48	Addition, mixed numbers
5.5	100	49	Subtraction, fractions
5.5	100	49	Addition, fractions
11	97.9	47	Measuring angles
12	98	48	Reducing mixed numbers to simplest form
13.5	95.9	47	Multiplication, fractions
13.5	95.9	47	Area of square
16	95.8	46	Division, mixed numbers
16	95.8	46	Multiplication, mixed numbers
16	95.8	40	Finding length of unknown side of right triangle
18	93.9	46	Division, fractions
19	93.8	45	Area of rectangle
20	91.8	45	Changing common fractions to decimals
21	91.7	44	Improper fractions, mixed numbers
22.5	89.8	44	Square root
22.5	89.8	44	Rounding off decimals
25	89.6	43	Reading, writing decimals
25	89.6	43	Area of triangle
25	89.6	43	Averages
27.5	89.4	42	Subtraction of decimals
27.5	89.4	42	Addition of decimals
29	87.8	43	Squaring a number
30.5	87.5	42	Volume of cube
30.5	87.5	42	Changing decimals to common fractions
32	87.2	41	Multiplication of decimals
33	85.7	42	Rounding numbers
34	85.4	41	Decimal equivalents
35.5	85.1	40	Volume of rectangular solid
35.5	85.1	40	Division of decimals
37	83.3	40	Comparing fractions
38.5	83	39	Using pi $\pi$
38.5	83	39	Area of circle using $A = \pi r^2$
39	82.6	38	Area of circle
40	81.4	35	Finding a number when a fractional part of it is known
41.5	80.9	38	Multiplying whole numbers and decimals by 10, 100, etc.
41.5	80.9	38	Dividing whole numbers and decimals by 10, 100, etc.
43	79.5	35	Acute and obtuse angles
44.5	78.7	37	Circumference using $C = \pi d = 2\pi r$
44.5	78.7	37	Area of parallelogram
46	75.6	34	Changing per cent to decimals
47	75	33	Ratio and proportion
48	74.4	32	Finding what part one number is of another
49	73.3	33	Meaning of percentage
51.5	68.9	31	Changing common fractions to per cents
51.5	68.9	31	Changing decimals to per cents
51.5	69.8	30	Changing per cents to common fractions
51.5	69.8	30	Finding per cent of a number
54	68.9	31	Volume of cylinder
55.5	66.7	32	Reading large numbers
55.5	66.7	30	Finding a number when a per cent of it is known
57.5	65.9	29	Area of trapezoid
57.5	65.9	29	Finding what per cent one number is of another
59	55.6	25	Simple algebraic equation with one unknown
60	55.3	24	Volume of pyramid
61.5	48.9	22	Volume of cone
61.5	48.9	22	Volume of sphere
63	45.7	21	Liquid measure
64	17.8	8	Temperature conversion
65	15.9	7	Micrometer reading

TABLE 12  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING CARPENTRY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	95.7	45	Square root
2	90	36	Acute and obtuse angles
3	89.5	34	Volume of pyramid
4	89.2	33	Volume of sphere
5	88.6	39	Using pi $\pi$
6.5	88.4	38	Finding a number when a fractional part of it is known
6.5	88.4	38	Area of circle using $A = \pi r^2$
8	89.4	42	Finding length of unknown side of right triangle
9	87.8	36	Volume of cylinder
10	87.5	35	Area of trapezoid
11	87.2	34	Simple algebraic equation with one unknown
12	86.8	33	Volume of cone
13	86.4	38	Circumference using $C = \pi d = 2\pi r$
14.5	85.4	41	Division, mixed numbers
14.5	85.4	35	Changing common fractions to per cents
16	85.1	40	Improper fractions, mixed numbers
17	85	34	Changing per cents to common fractions
18	84.8	39	Changing decimals to common fractions
19	84.1	37	Decimal equivalents
20.5	83.7	41	Multiplication, fractions
20.5	83.7	41	Division, fractions
22	83.3	35	Area of circle
23	83	39	Measuring angles
25	82.9	34	Finding per cent of a number
25	82.9	34	Finding what per cent one number is of another
25	82.9	34	Finding what part one number is of another
27	82.2	37	Volume of cube
28.5	80.9	38	Multiplication, mixed numbers
28.5	80.9	38	Reducing mixed numbers to simplest form
30.5	80.5	33	Changing decimals to per cents
30.5	80.5	33	Finding a number when a per cent of it is known
32.5	80.4	37	Area of triangle
32.5	80.4	37	Comparing fractions
34	80	32	Ratio and proportion
36	78.7	37	Changing common fractions to decimals
36	78.7	37	Reducing fractions to lowest terms
36	78.7	37	Subtraction, mixed numbers
39	77.6	38	Subtraction, fractions
39	76.6	36	Addition mixed numbers
39	76.6	36	Squaring a number
41	75.6	31	Changing per cent to decimals
42	75	33	Volume of rectangular solid
43	73.8	31	Area of parallelogram
44	72.1	31	Dividing whole numbers and decimals by 10, 100, etc.
45	71.4	35	Addition, fractions
46	71.1	32	Reading, writing decimals
47	69.8	30	Division of decimals
48	68.1	32	Rounding off decimals
49	67.6	25	Micrometer reading
50	65.3	32	Reading a rule
51	65.1	28	Multiplying whole numbers and decimals by 10,100,etc.
52	64.6	31	Averages
53	61.5	24	Liquid measure
54	61.4	27	Multiplication of decimals
55	59.5	25	Meaning of percentage
56.5	56.8	25	Addition of decimals
56.5	56.8	25	Subtraction of decimals
58	56.5	26	Rounding numbers
59	55.3	26	Area of square
60	55.1	27	Division, whole numbers
61	54.1	20	Temperature conversion
62	50	23	Area of rectangle
63	47.9	23	Multiplication, whole numbers
64	46.5	20	Reading large numbers
65	35.4	17	Subtraction, whole numbers
66	31.3	15	Addition, whole numbers



TABLE 13  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF COSMETOLOGY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	98	49	Addition, whole numbers
2	92	46	Subtraction, whole numbers
3	89.8	44	Liquid measure
4	87.8	43	Multiplication, whole numbers
5	85.7	42	Division, whole numbers
6	75.6	34	Meaning of percentage
7	69.6	32	Averages
8	61.7	29	Finding per cent of a number
9	61.2	30	Addition, fractions
10	60.9	28	Addition, mixed numbers
11	58.3	28	Subtraction, fractions
12	55.6	25	Reading, writing decimals
13	54.3	25	Subtraction, mixed numbers
14	51	25	Multiplication, fractions
15	50	23	Addition of decimals
16	48.9	23	Division, fractions
17	48.8	21	Rounding numbers
18	47.8	22	Finding what per cent one number is of another
19	46.7	21	Changing decimals to per cents
20	45.7	21	Subtraction of decimals
21	45.5	20	Changing per cent to decimals
22	44.4	20	Multiplication, mixed numbers
23.5	43.2	19	Reading large numbers
23.5	43.2	19	Multiplying whole numbers and decimals by 10, 100, etc.
25.5	40	18	Multiplication of decimals
25.5	40	18	Division of decimals
27	37.8	17	Division, mixed numbers
28	36.8	16	Changing common fractions to per cents
29	35.7	15	Dividing whole numbers and decimals by 10, 100, etc.
30	35.6	16	Reducing fractions to lowest terms
31	34.9	15	Changing per cents to common fractions
33	34.1	15	Comparing fractions
33	31.1	14	Improper fractions, mixed numbers
33	34.1	15	Rounding off decimals
35.5	32.6	14	Finding a number when a per cent of it is known
35.5	32.6	14	Decimal equivalents
37	31	13	Ratio and proportion
38.5	27.9	12	Finding what part one number is of another
38.5	27.9	12	Changing common fractions to decimals
40	25.6	11	Changing decimals to common fractions
41	25	11	Reducing mixed numbers to simplest form
42	21.4	9	Finding a number when a fractional part of it is known
43	20.9	9	Reading a rule
44	14.6	6	Temperature conversion
45.5	11.6	5	Measuring angles
45.5	11.6	5	Area of rectangle
47.5	9.3	4	Area of square
47.5	9.3	4	Area of circle
49	7.1	3	Squaring a number
50.5	7	3	Area of triangle
50.5	7	3	Square root
52.5	4.9	2	Micrometer reading
52.5	4.9	2	Simple algebraic equation with one unknown
54	4.8	2	Area of parallelogram
59	4.7	2	Volume of rectangular solid
59	4.7	2	Volume of cube
59	4.7	2	Volume of cylinder
59	4.7	2	Volume of sphere
59	4.7	2	Volume of cone
59	4.7	2	Volume of pyramid
59	4.7	2	Acute and obtuse angles
59	4.7	2	Finding length of unknown side of right triangle
59	4.7	2	Area of trapezoid
64	2.4	1	Area of circle using $A = \pi r^2$
65.5	0	0	Using $\pi$
65.5	0	0	Circumference using $C = \pi d = 2\pi r$

TABLE 14  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING COSMETOLOGY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	71.8	28	Meaning of percentage
2	65.1	28	Addition, fractions
3	61.9	26	Subtraction, fractions
4	61.6	22	Changing decimals to per cents
5	61.5	24	Finding per cent of a number
6	57.9	22	Addition, mixed numbers
7	57.4	27	Liquid measure
8	56.8	21	Changing common fractions to decimals
9	56.1	23	Averages
10.5	55.3	21	Subtraction, mixed numbers
10.5	55.3	21	Reducing fractions to lowest terms
12	55	22	Division, fractions
13	54.8	23	Multiplication, fractions
14.5	54.1	20	Finding what per cent one number is of another
14.5	54.1	20	Comparing fractions
16.5	53.1	17	Changing decimals to common fractions
16.5	53.1	17	Decimal equivalents
18.5	52.6	20	Reading, writing decimals
18.5	52.6	20	Rounding off decimals
21	51.4	19	Multiplication, mixed numbers
21	51.4	18	Division of decimals
21	51.4	18	Changing per cent to decimals
24.5	50	18	Addition of decimals
24.5	50	16	Finding a number when a per cent of it is known
24.5	50	17	Multiplying whole numbers and decimals by 10,100,etc.
24.5	50	18	Improper fractions, mixed numbers
27	48.9	23	Division, whole numbers
28	48.6	18	Division, mixed numbers
29	48.5	16	Reading a rule
30	47.2	17	Subtraction of decimals
31	47.1	16	Multiplication of decimals
32	46.9	15	Dividing whole numbers and decimals by 10,100,etc.
33.5	44.1	15	Changing per cents to common fractions
33.5	44.1	15	Changing common fractions to per cents
37	43.8	14	Area of trapezoid
37	43.8	14	Area of rectangle
37	43.8	14	Area of square
37	43.8	14	Area of parallelogram
37	43.8	21	Addition, whole numbers
40	43.2	16	Ratio and proportion
41	42.6	20	Multiplication, whole numbers
45	41.9	13	Area of circle using $A = \pi r^2$
45	41.9	13	Volume of rectangular solid
45	41.9	13	Volume of cube
45	41.9	13	Volume of cylinder
45	41.9	13	Volume of sphere
45	41.9	13	Volume of cone
45	41.9	13	Volume of pyramid
51	40.6	13	Area of triangle
51	40.6	13	Area of circle
51	40.6	13	Finding what part one number is of another
51	40.6	13	Finding a number when a fractional part of it is known
51	40.6	13	Circumference using $C = \pi d = 2\pi r$
54.5	40	14	Reducing mixed numbers to simplest form
54.5	40	12	Square root
56	39.6	19	Subtraction, whole numbers
57.5	39.4	13	Using $\pi$
57.5	39.4	13	Finding length of unknown side of right triangle
59	38.2	13	Temperature conversion
60	37.5	12	Acute and obtuse angles
61	36.7	11	Simple algebraic equation with one unknown
62	36.4	12	Measuring angles
63	34.5	10	Micrometer reading
64	33.3	10	Squaring a number
65	30.8	12	Rounding numbers
66	28.2	11	Reading large numbers

TABLE 15  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DRAFTING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
8	100	43	Rounding off decimals
8	100	43	Reading, writing decimals
8	100	43	Reducing mixed numbers to simplest form
8	100	44	Subtraction, whole numbers
8	100	43	Subtraction, mixed numbers
8	100	43	Addition, whole numbers
8	100	43	Addition, mixed numbers
8	100	44	Subtraction, fractions
8	100	43	Changing common fractions to decimals
8	100	44	Addition, fractions
8	100	44	Subtraction of decimals
8	100	44	Addition of decimals
8	100	44	Decimal equivalents
8	100	44	Reading a rule
8	100	44	Measuring angles
19	97.7	43	Changing decimals to common fractions
19	97.7	42	Improper fractions, mixed numbers
19	97.7	43	Reducing fractions to lowest terms
19	97.7	43	Multiplication, whole numbers
19	97.7	43	Division, whole numbers
19	97.7	43	Acute and obtuse angles
19	97.7	42	Rounding numbers
24	95.5	42	Area of rectangle
24	95.5	42	Circumference using $C = \pi d = 2\pi r$
24	95.5	42	Area of square
28	95.3	41	Division, mixed numbers
28	95.3	41	Multiplication, fractions
28	95.3	41	Division, fractions
28	95.3	41	Division of decimals
28	95.3	41	Using pi $\pi$
31	93.2	41	Finding length of unknown side of right triangle
33.5	93	40	Multiplication of decimals
33.5	93	40	Comparing fractions
33.5	93	40	Area of circle using $A = \pi r^2$
33.5	93	40	Area of triangle
36	92.9	39	Multiplication mixed numbers
37	90.9	40	Squaring a number
39.5	90.7	39	Multiplying whole numbers and decimals by 10,100,etc.
39.5	90.7	39	Dividing whole numbers and decimals by 10, 100, etc.
39.5	90.7	39	Area of circle
39.5	90.7	39	Area of parallelogram
42	88.6	39	Square root
44	88.4	38	Area of trapezoid
44	88.4	38	Simple algebraic equation with one unknown
44	88.4	38	Reading large numbers
47	86	37	Volume of rectangular solid
47	86	37	Volume of cube
47	86	37	Finding a number when a fractional part of it is known
49.5	84.1	37	Changing decimals to per cents
49.5	84.1	37	Changing per cent to decimals
52.5	83.7	36	Volume of cylinder
52.5	83.7	36	Changing per cents to common fractions
52.5	83.7	36	Changing common fractions to per cents
52.5	83.7	36	Finding what part one number is of another
55	83.3	35	Ratio and proportion
56	81.8	36	Meaning of percentage
57.5	81.4	35	Finding per cent of a number
57.5	81.4	35	Finding a number when a per cent of it is known
59	79.5	35	Micrometer reading
61.5	79.1	34	Finding what per cent one number is of another
61.5	79.1	34	Volume of pyramid
61.5	79.1	34	Volume of sphere
61.5	79.1	34	Volume of cone
64	72.1	31	Averages
65	46.5	20	Liquid measure
66	44.2	19	Temperature conversion

TABLE 16  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DRAFTING STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	84.6	33	Volume of cone
1.5	84.6	33	Volume of pyramid
3	84.2	32	Volume of sphere
4	82.1	32	Volume of cylinder
5	80	32	Area of trapezoid
6.5	78.6	33	Finding a number when a fractional part of it is known
6.5	78.6	33	Finding length of unknown side of right triangle
8	77.8	28	Temperature conversion
9	77.5	31	Ratio and proportion
10.5	76.2	32	Finding what part one number is of another
10.5	76.2	32	Simple algebraic equation with one unknown
12	74.4	32	Changing common fractions to decimals
13	73.8	31	Square root
14	73.2	30	Micrometer reading
15.5	72.5	29	Changing per cents to common fractions
15.5	72.5	29	Area of parallelogram
17	71.4	30	Changing decimals to common fractions
18.5	70.7	29	Changing common fractions to per cents
18.5	70.7	29	Finding a number when a per cent of it is known
20	69.2	27	Area of circle using $A = \pi r^2$
22	69	29	Acute and obtuse angles
22	69	29	Decimal equivalents
22	69	29	Measuring angles
24	66.7	28	Circumference using $C = \pi d = 2\pi r$
25	65.9	27	Finding what per cent one number is of another
26	65.1	28	Reducing fractions to lowest terms
27.5	65	26	Area of circle
27.5	65	26	Area of triangle
30.5	63.4	26	Division of decimals
30.5	63.4	26	Changing decimals to per cents
30.5	63.4	26	Comparing fractions
30.5	63.4	26	Using $\pi$
33.5	62.8	27	Reducing mixed numbers to simplest form
33.5	62.8	27	Division, mixed numbers
35	62.5	25	Finding per cent of a number
36	61.5	24	Volume of cube
37.5	60.5	26	Reading, writing decimals
37.5	60.5	26	Improper fractions, mixed numbers
39	60	21	Liquid measure
40	59.5	25	Rounding off decimals
41.5	58.5	24	Meaning of percentage
41.5	58.5	24	Changing per cent to decimals
44	58.1	25	Reading a rule
44	58.1	25	Addition, mixed numbers
44	58.1	25	Subtraction, mixed numbers
46.5	57.1	24	Multiplication, mixed numbers
46.5	57.1	24	Division, fractions
48	56.4	22	Volume of rectangular solid
49	55.8	24	Subtraction, fractions
50	54.8	23	Multiplication, fractions
51	51.2	22	Addition, fractions
52	47.5	19	Averages
53	45.2	19	Squaring a number
54	45	18	Dividing whole numbers and decimals by 10,100,etc.
55	42.9	18	Area of rectangle
56.5	41.5	17	Area of square
56.5	41.5	17	Multiplication of decimals
58	40	16	Multiplying whole numbers and decimals by 10,100,etc.
59	38.1	16	Subtraction of decimals
60	35.7	15	Addition of decimals
61	34.9	15	Rounding numbers
62	31	13	Division, whole numbers
63	23.3	10	Multiplication, whole numbers
64	20.9	9	Reading large numbers
65	14.3	6	Subtraction, whole numbers
66	11.6	5	Addition, whole numbers

TABLE 17

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DRESSMAKING RELATED TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	20	Addition, whole numbers
2.5	95	19	Subtraction, whole numbers
2.5	95	19	Multiplication, whole numbers
4.5	90	18	Division, whole numbers
4.5	90	18	Addition, fractions
6	85	17	Subtraction, fractions
7	77.8	14	Rounding numbers
8	75	15	Division, fractions
9	72.2	13	Reading a rule
10.5	70	14	Reducing fractions to lowest terms
10.5	70	14	Multiplication, fractions
12	68.4	13	Reading large numbers
13	63.2	12	Addition, mixed numbers
14.5	57.9	11	Averages
14.5	57.9	11	Subtraction, mixed numbers
16	52.9	9	Meaning of percentage
18	52.6	10	Reducing mixed numbers to simplest form
18	52.6	10	Multiplication, mixed numbers
18	52.6	10	Division, mixed numbers
20.5	50	9	Reading, writing decimals
20.5	50	9	Comparing fractions
22.5	41.2	7	Rounding off decimals
22.5	41.2	7	Measuring angles
24	38.9	7	Improper fractions, mixed numbers
26	35.3	6	Multiplying whole numbers and decimals by 10, 100, etc.
26	35.3	6	Changing common fractions to per cents
26	35.3	6	Finding per cent of a number
28	29.4	5	Changing decimals to per cents
29.5	27.8	5	Changing common fractions to decimals
29.5	27.8	5	Area of square
34.5	23.5	4	Ratio and proportion
34.5	23.5	4	Dividing whole numbers and decimals by 10, 100, etc.
34.5	23.5	4	Addition of decimals
34.5	23.5	4	Subtraction of decimals
34.5	23.5	4	Multiplication of decimals
34.5	23.5	4	Changing per cents to decimals
34.5	23.5	4	Finding what per cent one number is of another
34.5	23.5	4	Changing per cents to common fractions
39	18.8	3	Acute and obtuse angles
42.5	17.6	3	Area of circle
42.5	17.6	3	Division of decimals
42.5	17.6	3	Changing decimals to common fractions
42.5	17.6	3	Finding a number when a per cent of it is known
42.5	17.6	3	Finding what part one number is of another
42.5	17.6	3	Finding a number when a fractional part of it is known
46.5	16.7	3	Area of rectangle
46.5	16.7	3	Circumference using $C = \pi d = 2\pi r$
48.5	11.8	2	Decimal equivalents
48.5	11.8	2	Squaring a number
50.5	11.1	2	Using $\pi$
50.5	11.1	2	Area of parallelogram
53	5.9	1	Liquid measure
53	5.9	1	Finding length of unknown side of right triangle
53	5.9	1	Area of circle using $A = \pi r^2$
55	5.6	1	Area of triangle
61	0	0	Temperature conversion
61	0	0	Area of trapezoid
61	0	0	Square root
61	0	0	Volume of rectangular solid
61	0	0	Volume of cube
61	0	0	Volume of cylinder
61	0	0	Volume of sphere
61	0	0	Volume of cone
61	0	0	Volume of pyramid
61	0	0	Simple algebraic equation with one unknown
61	0	0	Micrometer reading

TABLE 18  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DRESSMAKING RELATED STUDENT

RANK	PERCENT	NUMBER	SKILL
1	93.2	14	Improper fractions, mixed numbers
4	92.9	14	Finding a number when a fractional part of it is known
4	92.9	13	Changing per cents to common fractions
4	92.9	13	Changing common fractions to per cents
4	92.9	13	Changing decimals to common fractions
4	92.9	13	Finding what per cent one number is of another
7.5	92.3	12	Rounding off decimals
7.5	92.3	12	Changing common fractions to decimals
9	90	18	Addition, fractions
10.5	87.5	14	Comparing fractions
10.5	87.5	14	Subtraction, mixed numbers
12.5	86.7	13	Changing per cent to decimals
12.5	86.7	13	Changing decimals to per cents
17.5	85.7	12	Ratio and proportion
17.5	85.7	12	Measuring angles
17.5	85.7	12	Acute and obtuse angles
17.5	85.7	12	Finding length of unknown side of right triangle
17.5	85.7	12	Area of circle
17.5	85.7	12	Decimal equivalents
17.5	85.7	12	Finding a number when a per cent of it is known
17.5	85.7	12	Finding what part one number is of another
22.5	85	17	Division, fractions
22.5	85	17	Subtraction, fractions
27.5	84.6	11	Volume of rectangular solid
27	84.6	11	Volume of cube
27	84.6	11	Volume of cylinder
27	84.6	11	Volume of sphere
27	84.6	11	Volume of cone
27	84.6	11	Volume of pyramid
27	84.6	11	Simple algebraic equation with one unknown
31	84.2	16	Multiplication, fractions
33.5	81.3	13	Reducing mixed numbers to simplest form
33.5	81.3	13	Addition, mixed numbers
33.5	81.3	13	Multiplication, mixed numbers
33.5	81.3	13	Division, mixed numbers
36	80	12	Area of square
38.5	78.6	11	Temperature conversion
38.5	78.6	11	Area of trapezoid
38.5	78.6	11	Square root
38.5	78.6	11	Multiplication of decimals
41	77.8	14	Reducing fractions to lowest terms
42	76.5	13	Reading a rule
46	73.3	11	Using $\pi$
46	73.3	11	Circumference using $C = \pi d = 2\pi r$
46	73.3	11	Area of circle using $A = \pi r^2$
46	73.3	11	Area of rectangle
46	73.3	11	Area of parallelogram
46	73.3	11	Area of triangle
46	73.3	11	Meaning of percentage
52	71.4	10	Division of decimals
52	71.4	10	Squaring a number
52	71.4	10	Reading, writing decimals
52	71.4	10	Subtraction of decimals
52	71.4	10	Finding per cent of a number
55	69.2	9	Liquid measure
56	64.7	11	Averages
58	64.3	9	Multiplying whole numbers and decimals by 10,100,etc.
58	64.3	9	Dividing whole numbers and decimals by 10,100,etc.
58	64.3	9	Micrometer reading
60	62.5	10	Rounding numbers
61	60	12	Division, whole numbers
62	57.1	8	Addition of decimals
63	55	11	Multiplication, whole numbers
64	52.9	9	Reading large numbers
65.5	26.3	5	Addition, whole numbers
65.5	26.3	5	Subtraction, whole numbers

TABLE 19  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF ELECTRICAL MAINTENANCE CONSTRUCTION TEACHERS WHO FELT THAT THE  
SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
5.5	100	39	Addition, whole numbers
5.5	100	39	Subtraction, whole numbers
5.5	100	39	Multiplication, whole numbers
5.5	100	39	Division, whole numbers
5.5	100	39	Reading, writing decimals
5.5	100	39	Addition of decimals
5.5	100	39	Subtraction of decimals
5.5	100	39	Multiplication of decimals
5.5	100	39	Division of decimals
5.5	100	39	Reading a rule
11.5	97.4	37	Rounding off decimals
11.5	97.4	38	Dividing whole numbers and decimals by 10, 100, etc.
15.5	94.9	37	Finding per cent of a number
15.5	94.9	37	Addition, fractions
15.5	94.9	37	Subtraction, fractions
15.5	94.9	37	Decimal equivalents
15.5	94.9	37	Changing common fractions to decimals
15.5	94.9	37	Multiplying whole numbers and decimals by 10, 100, etc.
21	92.3	36	Rounding numbers
21	92.3	36	Addition, mixed numbers
21	92.3	36	Subtraction, mixed numbers
21	92.3	36	Multiplication, fractions
21	92.3	36	Meaning of percentage
26	89.7	35	Changing per cent to decimals
26	89.7	35	Multiplication, mixed numbers
26	89.7	35	Area of square
26	89.7	35	Division, fractions
26	89.7	35	Squaring a number
29	89.5	34	Division, mixed numbers
31	87.2	34	Reading large numbers
31	87.2	34	Reducing fractions to lowest
31	87.2	34	Changing decimals to common fractions
33	86.8	33	Simple algebraic equation with one unknown
36	84.6	33	Ratio and proportion
36	84.6	33	Finding what per cent one number is of another
36	84.6	33	Changing decimals to per cents
36	84.6	33	Using $\pi$
36	84.6	33	Square root
40.5	82.1	32	Finding a number when a per cent of it is known
40.5	82.1	32	Averages
40.5	82.1	32	Improper fractions, mixed numbers
40.5	82.1	32	Reducing mixed numbers to simplest form
43	79.5	31	Measuring angles
45	76.9	30	Comparing fractions
45	76.9	30	Changing common fractions to per cents
45	76.9	30	Finding what part one number is of another
47.5	74.4	29	Finding a number when a fractional part of it is known
47.5	74.4	29	Area of rectangle
50	71.8	28	Micrometer reading
50	71.8	28	Finding length of unknown side of right triangle
50	71.8	28	Area of circle
53	69.2	27	Area of circle using $A = \pi r^2$
53	69.2	27	Circumference using $C = \pi d = 2\pi r$
53	69.2	27	Changing per cents to common fractions
55	63.2	24	Temperature conversion
56	53.8	21	Acute and obtuse angles
57	46.2	18	Area of triangle
58	38.5	15	Area of parallelogram
59	30.8	12	Liquid measure
60	28.2	11	Volume of rectangular solid
61	23.1	9	Volume of cube
62	20.5	8	Area of trapezoid
63	17.9	7	Volume of cylinder
65	10.3	4	Volume of sphere
65	10.3	4	Volume of cone
65	10.3	4	Volume of pyramid

TABLE 20  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING ELECTRICAL MAINTENANCE CONSTRUCTION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	84.2	32	Ratio and proportion
2	79.5	31	Square root
3	78.4	29	Finding length of unknown side of right triangle
4	77.8	28	Temperature conversion
5	76.3	29	Finding a number when a per cent of it is known
6	75	27	Acute and obtuse angles
7.5	74.4	29	Decimal equivalents
7.5	74.4	29	Multiplication, mixed numbers
9.5	73.7	28	Finding what part one number is of another
9.5	73.7	28	Finding a number when a fractional part of it is known
11	73.6	28	Division, mixed numbers
12.5	71.8	28	Reducing mixed numbers to simplest form
12.5	71.8	28	Division of decimals
14	71.7	27	Measuring angles
15.5	71.1	27	Division, fractions
15.5	71.1	27	Finding what per cent one number is of another
17	70.3	26	Simple algebraic equation with one unknown
19.5	69.2	27	Changing common fractions to decimals
19.5	69.2	27	Multiplication, fractions
19.5	69.2	27	Reducing fractions to lowest terms
19.5	69.2	27	Multiplication of decimals
22	68.4	26	Comparing fractions
23	67.6	25	Micrometer reading
24.5	65.8	25	Changing common fractions to per cents
24.5	65.8	25	Finding per cent of a number
26.5	65.7	23	Circumference using $C = \pi d = 2\pi r$
26.5	65.7	23	Area of circle using $A = \pi r^2$
28	64.9	24	Changing decimals to common fractions
30	64.1	25	Subtraction, fractions
30	64.1	25	Addition, mixed numbers
30	64.1	25	Subtraction, mixed numbers
32	63.2	24	Changing decimals to per cents
33	62.2	23	Changing per cents to common fractions
34.5	61.5	24	Improper fractions, mixed numbers
34.5	61.5	24	Addition, fractions
36.5	60.5	23	Meaning of percentage
36.5	60.5	23	Changing per cent to decimals
39	59.4	19	Volume of sphere
39	59.4	19	Volume of cone
39	59.4	19	Area of trapezoid
41	58.1	18	Volume of pyramid
42	57.9	22	Dividing whole numbers and decimals by 10,100,etc.
43	56.8	21	Using $\pi$
44	56.4	22	Subtraction of decimals
45	56.3	18	Volume of rectangular solid
46	53.8	21	Reading, writing decimals
47.5	53.1	17	Volume of cube
47.5	53.1	17	Volume of cylinder
49	51.7	20	Area of circle
50	51.4	18	Area of parallelogram
51.5	48.7	19	Squaring a number
51.5	48.7	19	Addition of decimals
54	47.4	18	Averages
54	47.4	18	Area of rectangle
54	47.4	18	Area of square
56	47.2	17	Area of triangle
57	46.2	18	Multiplying whole numbers and decimals by 10,100,etc.
58	43.6	17	Rounding off decimals
59	41	16	Reading a rule
60	38.5	15	Division, whole numbers
61	38.2	13	Liquid measure
62	35.9	14	Reading large numbers
63	28.2	11	Multiplication, whole numbers
64	25.6	10	Rounding numbers
65	17.8	7	Subtraction, whole numbers
66	12.8	5	Addition, whole numbers



TABLE 21  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF ELECTRONICS TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
4	100	48	Multiplication of decimals
4	100	48	Division of decimals
4	100	48	Addition, whole numbers
4	100	47	Subtraction, whole numbers
4	100	48	Multiplication, whole numbers
4	100	48	Division, whole numbers
4	100	49	Reading, writing decimals
8	98	48	Squaring a number
10.5	97.9	47	Rounding off decimals
10.5	97.9	47	Ratio and proportion
10.5	97.9	47	Multiplying whole numbers and decimals by 10,100, etc.
10.5	97.9	47	Dividing whole numbers and decimals by 10,100, etc.
14	95.9	47	Square root
14	95.9	47	Simple algebraic equation with one unknown
14	95.9	47	Addition of decimals
16.5	95.8	46	Subtraction of decimals
16.5	95.8	46	Using pi $\pi$
18.5	95.7	45	Rounding numbers
18.5	95.7	45	Meaning of percentage
20	93.9	46	Changing common fractions to decimals
21	93.8	45	Reading large numbers
22.5	93.6	44	Finding per cent of a number
22.5	93.6	44	Averages
24	93.3	42	Decimal equivalents
25.5	91.7	44	Changing per cent to decimals
25.5	91.7	44	Changing decimals to per cents
27.5	89.4	42	Changing decimals to common fractions
27.5	89.4	42	Addition, fractions
29	87.5	42	Finding what part one number is of another
31	87.2	41	Reducing fractions to lowest terms
31	87.2	41	Multiplication, fractions
31	87.2	41	Finding what per cent one number is of another
33.5	85.1	40	Division, fractions
33.5	85.1	40	Subtraction, fractions
35	84.8	39	Comparing fractions
36.5	83.3	40	Addition, mixed numbers
36.5	83.3	40	Subtraction, mixed numbers
38.5	83	39	Reducing mixed numbers to simplest form
38.5	83	39	Finding a number when a per cent of it is known
40	81.6	40	Reading a rule
41	81.3	39	Finding length of unknown side of right triangle
42	80.9	38	Improper fractions, mixed numbers
43	80.4	36	Finding a number when a fractional part of it is known
44.5	79.2	38	Multiplication, mixed numbers
44.5	79.2	38	Division, mixed numbers
46	78.7	37	Changing common fractions to per cents
47	76.6	36	Measuring angles
48	76.1	35	Changing per cents to common fractions
49	64.6	31	Acute and obtuse angles
50	60	31	Temperature conversion
51	57.4	27	Area of circle using $A = \pi r^2$
52	53.2	25	Circumference using $C = \pi d = 2\pi r$
53	51.1	24	Area of rectangle
54	48.9	23	Area of circle
55	46.8	22	Area of square
56	43.5	20	Micrometer reading
57	35.6	16	Area of parallelogram
58	34.8	16	Area of triangle
59.5	25	11	Volume of rectangular solid
59.5	25	11	Volume of cube
61.5	20.5	9	Volume of cylinder
61.5	20.5	9	Volume of sphere
63	17.8	8	Area of trapezoid
64	18.2	8	Volume of cone
65	15.9	7	Volume of pyramid
66	11.4	5	Liquid measure

TABLE 22  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING ELECTRONICS STUDENT

RANK	PERCENT	NUMBER	SKILL
1	83	39	Square root
2	81.3	39	Ratio and proportion
3	78.3	36	Finding length of unknown side of right triangle
4.5	73.9	34	Finding what per cent one number is of another
4.5	73.9	34	Finding what part one number is of another
6	72.7	32	Temperature conversion
7	71.1	32	Finding a number when a per cent of it is known
8	68.3	28	Decimal equivalents
9	68.1	32	Division of decimals
10	67.4	29	Finding a number when a fractional part of it is known
11	66.7	32	Simple algebraic equation with one unknown
12	65.2	30	Division, fractions
13	64.6	31	Changing common fractions to decimals
14.5	64.3	27	Circumference using $C = \pi d = 2\pi r$
14.5	64.3	27	Micrometer reading
16	63.8	30	Addition, fractions
17	63.6	28	Comparing fractions
18	63.4	26	Area of circle using $A = \pi r^2$
19	63	29	Subtraction, fractions
20	62.8	27	Acute and obtuse angles
21.5	61.7	29	Using pi $\pi$
21.5	61.7	29	Reducing fractions to lowest terms
24	60.9	28	Measuring angles
24	60.9	28	Multiplying whole numbers and decimals by 10,100,etc.
24	60.9	28	Dividing whole numbers and decimals by 10,100,etc.
26	60.5	26	Changing decimals to common fractions
28	60	27	Improper fractions, mixed numbers
28	60	27	Finding per cent of a number
28	60	27	Division, mixed numbers
30.5	59.6	28	Averages
30.5	59.6	28	Multiplication of decimals
32	59.1	26	Changing common fractions to per cents
33	58.7	27	Meaning of percentage
34	58.5	24	Area of circle
35	58.1	25	Changing per cents to common fractions
36	57.9	22	Area of triangle
37	56.8	21	Area of trapezoid
38	56.5	26	Multiplication, fractions
40	55.6	20	Volume of sphere
40	55.6	20	Volume of cone
40	55.6	20	Volume of pyramid
42	54.5	24	Multiplication, mixed numbers
43.5	54.3	25	Changing per cent to decimals
43.5	54.3	25	Changing decimals to per cents
45	54.2	26	Reading, writing decimals
46	54.1	20	Area of parallelogram
47.5	52.8	19	Volume of cube
47.5	52.8	19	Volume of cylinder
49	52.3	23	Reducing mixed numbers to simplest form
50	51.1	23	Reading a rule
51.5	50	20	Area of rectangle
51.5	50	18	Volume of rectangular solid
53.5	48.9	23	Squaring a number
53.5	48.9	23	Rounding off decimals
55	45.7	21	Subtraction, mixed numbers
56	44.7	21	Addition, mixed numbers
57	41.3	19	Subtraction of decimals
58	41.2	14	Liquid measure
59	41	16	Area of square
60	40.4	19	Addition of decimals
61	38.3	18	Reading large numbers
62	36.2	17	Rounding numbers
63	30.4	14	Division, whole numbers
64	21.7	10	Multiplication, whole numbers
65	13.3	6	Subtraction, whole numbers
66	13	16	Addition, whole numbers

TABLE 23  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF INDUSTRIAL ELECTRICAL TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
11	100	20	Meaning of percentage
11	100	20	Rounding off decimals
11	100	20	Addition, whole numbers
11	100	20	Changing per cent to decimals
11	100	19	Reading, writing decimals
11	100	19	Changing decimals to per cents
11	100	20	Addition of decimals
11	100	20	Squaring a number
11	100	20	Subtraction, whole numbers
11	100	20	Multiplication, whole numbers
11	100	20	Division, whole numbers
15	95	19	Multiplying whole numbers and decimals by 10,100, etc.
15	95	19	Subtraction of decimals
15	95	19	Division of decimals
15	95	19	Multiplication of decimals
15	95	19	Reading a rule
15	95	19	Square root
15	95	19	Dividing whole numbers and decimals by 10,100,etc.
20	94.7	18	Changing common fractions to decimals
20	94.7	18	Rounding numbers
20	94.7	18	Reading large numbers
22	90	18	Averages
24.5	89.5	17	Using $\pi$
24.5	89.5	17	Simple algebraic equation with one unknown
24.5	89.5	17	Multiplication, fractions
24.5	89.5	17	Division, fractions
27	85	17	Ratio and proportion
32	84.2	16	Addition, fractions
32	84.2	16	Subtraction, mixed numbers
32	84.2	16	Decimal equivalents
32	84.2	16	Addition, mixed numbers
32	84.2	16	Division, mixed numbers
32	84.2	16	Multiplication, mixed numbers
32	84.2	16	Improper fractions, mixed numbers
32	84.2	16	Reducing fractions to lowest terms
32	84.2	16	Subtraction, fractions
40	78.9	15	Measuring angles
40	78.9	15	Changing per cents to common fractions
40	78.9	15	Temperature conversion
40	78.9	15	Changing decimals to common fractions
40	78.9	15	Changing common fractions to per cents
40	78.9	15	Finding what per cent one number is of another
40	78.9	15	Reducing mixed numbers to simplest form
45.5	73.7	14	Area of rectangle
45.5	73.7	14	Comparing fractions
45.5	73.7	14	Finding length of unknown side of right triangle
45.5	73.7	14	Area of circle using $A = \pi r^2$
48	72.2	13	Area of square
49.5	68.4	13	Area of circle
49.5	68.4	13	Circumference using $C = \pi d = 2\pi r$
52	66.7	12	Finding what part one number is of another
52	66.7	12	Finding a number when a per cent of it is known
52	66.7	12	Finding a number when a fractional part of it is known
54	61.1	11	Acute and obtuse angles
55	57.9	11	Micrometer reading
56	50	9	Area of triangle
58	38.9	7	Volume of rectangular solid
58	38.9	7	Volume of cube
58	38.9	7	Area of parallelogram
60	26.3	5	Liquid measure
61.5	22.2	4	Volume of cylinder
61.5	22.2	4	Area of trapezoid
64	16.7	3	Volume of pyramid
64	16.7	3	Volume of cone
64	16.7	3	Volume of sphere
66	9.5	19	Finding per cent of a number

TABLE 24  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING INDUSTRIAL ELECTRICAL STUDENT

RANK	PERCENT	NUMBER	SKILL
1	94.7	18	Finding what per cent one number is of another
4	94.4	17	Finding a number when a per cent of it is known
4	94.4	17	Finding what part one number is of another
4	94.4	16	Finding a number when a fractional part of it is known
4	94.4	17	Measuring angles
4	94.4	17	Finding length of unknown side of right triangle
7	94.1	16	Acute and obtuse angles
8	90	18	Square root
9	88.9	16	Changing common fractions to decimals
10	88.2	15	Area of trapezoid
12	87.5	14	Volume of sphere
12	87.5	14	Volume of cone
12	87.5	14	Volume of pyramid
14	85	17	Simple algebraic equation with one unknown
16.5	84.2	14	Volume of cylinder
16.5	84.2	14	Area of triangle
17.5	82.4	16	Micrometer reading
17.5	82.4	16	Temperature conversion
19	80	16	Ratio and proportion
20.5	78.9	15	Decimal equivalents
20.5	78.9	15	Division, fractions
23	77.8	14	Division, mixed numbers
23	77.8	14	Area of parallelogram
23	77.8	14	Changing decimals to common fractions
25	75	15	Finding per cent of a number
27.5	73.7	14	Multiplication of decimals
27.5	73.7	14	Division of decimals
27.5	73.7	14	Changing decimals to per cents
27.5	73.7	14	Area of circle using $A = \pi r^2$
31	72.2	13	Using pi $\pi$
31	72.2	13	Changing per cents to common fractions
31	72.2	13	Changing common fractions to per cents
33	70.6	12	Volume of rectangular solid
34.5	70	14	Meaning of percentage
34.5	70	14	Changing per cent to decimals
37	68.4	13	Circumference using $C = \pi d = 2\pi r$
37	68.4	13	Multiplying whole numbers and decimals by 10,100,etc.
37	68.4	13	Multiplication, fractions
40	66.7	12	Area of circle
40	66.7	12	Rounding off decimals
40	66.7	12	Multiplication, mixed numbers
42.5	63.2	12	Reading, writing decimals
42.5	63.2	12	Reading a rule
45.5	61.1	11	Improper fractions, mixed numbers
45.5	61.1	11	Volume of cube
45.5	61.1	11	Addition, fractions
45.5	61.1	11	Subtraction, fractions
48	58.8	10	Comparing fractions
49	57.9	11	Reducing fractions to lowest terms
50	55.6	10	Reducing mixed numbers to simplest form
51	52.9	9	Liquid measure
52.5	52.6	10	Area of rectangle
52.5	52.6	10	Area of square
54.5	50	9	Addition, mixed numbers
54.5	50	9	Subtraction, mixed numbers
57	47.4	9	Rounding numbers
57	47.4	9	Dividing whole numbers and decimals by 10, 100, etc.
57	47.4	9	Squaring a number
59	45	9	Averages
60.5	42.1	8	Addition of decimals
60.5	42.1	8	Subtraction of decimals
62	35	7	Division, whole numbers
63	31.6	6	Reading large numbers
65	20	4	Addition, whole numbers
65	20	4	Subtraction, whole numbers
65	20	4	Multiplication, whole numbers

TABLE 25

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF INTERIOR DECORATING/COMMERCIAL ART TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	26	Reading a rule
2.5	88.5	23	Measuring angles
2.5	88.5	23	Addition, whole numbers
4	88	22	Subtraction, whole numbers
5	84.6	22	Multiplication, whole numbers
6	84	21	Division, whole numbers
7.5	80	20	Addition, mixed numbers
7.5	80	20	Subtraction, mixed numbers
9	76.9	20	Division, mixed numbers
10	72	18	Multiplication, mixed numbers
11.5	69.2	18	Reducing mixed numbers to simplest form
11.5	69.2	18	Ratio and proportion
13.5	68	17	Addition, fractions
13.5	68	17	Subtraction, fractions
15.5	61.5	16	Reading large numbers
15.5	61.5	16	Meaning of percentage
17.5	60	15	Finding per cent of a number
17.5	60	15	Multiplication, fractions
19	57.1	15	Averages
21.5	56	14	Area of square
21.5	56	14	Division, fractions
21.5	56	14	Reducing fractions to lowest terms
21.5	56	14	Improper fractions, mixed numbers
24	53.8	14	Rounding numbers
25.5	52	13	Changing common fractions to decimals
25.5	52	13	Reading, writing decimals
30.5	48	12	Addition of decimals
30.5	48	12	Subtraction of decimals
30.5	48	12	Multiplication of decimals
30.5	48	12	Division of decimals
30.5	48	12	Finding what part one number is of another
30.5	48	12	Changing decimals to per cents
30.5	48	12	Rounding off decimals
30.5	48	12	Area of rectangle
35	45.8	11	Comparing fractions
37	44	11	Finding what per cent one number is of another
37	44	11	Acute and obtuse angles
37	44	11	Area of circle
39.5	42.3	11	Changing decimals to common fractions
39.5	42.3	11	Changing per cents to common fractions
42	40	10	Circumference using $C = \pi d = 2\pi r$
42	40	10	Multiplying whole numbers and decimals by 10, 100, etc.
42	40	10	Changing per cent to decimals
45.5	36	9	Area of circle using $A = \pi r^2$
45.5	36	9	Decimal equivalents
45.5	36	9	Dividing whole numbers and decimals by 10, 100, etc.
45.5	36	9	Area of triangle
48	33.3	8	Finding a number when a per cent of it is known
49.5	32	8	Changing common fractions to per cents
49.5	32	8	Using $\pi$
51	28	7	Liquid measure
54.5	24	6	Volume of rectangular solid
54.5	24	6	Volume of cube
54.5	24	6	Simple algebraic equation with one unknown
54.5	24	6	Finding a number when a fractional part of it is known
54.5	24	6	Finding length of unknown side of right triangle
54.5	24	6	Area of parallelogram
59.5	20	5	Squaring a number
59.5	20	5	Square root
59.5	20	5	Volume of sphere
59.5	20	5	Volume of pyramid
63	16	4	Volume of cone
63	16	4	Area of trapezoid
63	16	4	Volume of cylinder
65	8.3	2	Micrometer reading
66	4	1	Temperature conversion

TABLE 26

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING INTERIOR DECORATING/COMMERCIAL ART STUDENT

RANK	PERCENT	NUMBER	SKILL
1	80	20	Area of triangle
2.5	79.2	19	Volume of cube
2.5	79.2	19	Area of parallelogram
5.5	78.3	18	Volume of cylinder
5.5	78.3	18	Volume of sphere
5.5	78.3	18	Volume of cone
5.5	78.3	18	Volume of pyramid
9	76	19	Using pi $\pi$
9	76	19	Circumference using $C=\pi d=2\pi r$
9	76	19	Area of circle
11.5	75	18	Volume of rectangular solid
11.5	75	18	Area of trapezoid
13	73.9	17	Finding length of unknown side of right triangle
14	73.1	19	Measuring angles
15	72	18	Area of circle using $A=\pi r^2$
16	70.8	17	Reading, writing decimals
17	68	17	Ratio and proportion
19.5	66.7	16	Improper fractions, mixed numbers
19.5	66.7	16	Finding a number when a fractional part of it is known
19.5	66.7	16	Acute and obtuse angles
19.5	66.7	16	Simple algebraic equation with one unknown
22	65.4	17	Changing decimals to common fractions
23	65.2	15	Square root
24	64	16	Decimal equivalents
26.5	62.5	15	Dividing whole numbers and decimals by 10,100,etc.
26.5	62.5	15	Subtraction, fractions
26.5	62.5	15	Reducing fractions to lowest terms
26.5	62.5	15	Rounding off decimals
29	62	17	Changing common fractions to decimals
30	60	15	Finding what per cent one number is of another
31	59.1	13	Micrometer reading
34	58.3	14	Addition, fractions
34	58.3	14	Multiplication, fractions
34	58.3	14	Finding a number when a per cent of it is known
34	58.3	14	Finding what part one number is of another
34	58.3	14	Multiplying whole numbers and decimals by 10,100,etc.
37	56.5	13	Squaring a number
38.5	56	14	Finding per cent of a number
38.5	56	14	Reducing mixed numbers to simplest form
40	54.5	12	Temperature conversion
41.5	54.2	13	Division, fractions
41.5	54.2	13	Comparing fractions
44	53.8	14	Changing per cents to common fractions
44	53.8	14	Meaning of percentage
44	53.8	14	Reading a rule
48.5	52	13	Multiplication of decimals
48.5	52	13	Division of decimals
48.5	52	13	Area of rectangle
48.5	52	13	Changing per cent to decimals
48.5	52	13	Changing common fractions to per cents
52.5	50	12	Addition of decimals
52.5	50	12	Subtraction, mixed numbers
54.5	48	12	Subtraction of decimals
54.5	48	12	Area of square
56.5	45.8	11	Multiplication, mixed numbers
56.5	45.8	11	Addition, mixed numbers
58	44	11	Division, mixed numbers
59	43.5	10	Liquid measure
60	41.7	10	Rounding numbers
61	40	10	Reading large numbers
62	37.5	9	Averages
63	29.2	7	Division, whole numbers
64	28	7	Multiplication, whole numbers
65	26.9	7	Addition, whole numbers
66	24	6	Subtraction, whole numbers

TABLE 27  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF MACHINE TOOL DIE TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
6.5	100	99	Addition of decimals
6.5	100	99	Division of decimals
6.5	100	99	Decimal equivalents
6.5	100	99	Reading a rule
6.5	100	99	Micrometer reading
6.5	100	99	Subtraction of decimals
6.5	100	100	Addition, fractions
6.5	100	99	Changing common fractions to decimals
6.5	100	99	Division, whole numbers
6.5	100	100	Subtraction, fractions
6.5	100	100	Reading, writing decimals
6.5	100	99	Reducing fractions to lowest terms
16	99	98	Addition, whole numbers
16	99	98	Subtraction, mixed numbers
16	99	98	Multiplication of decimals
16	99	98	Subtraction, whole numbers
16	99	98	Addition, mixed numbers
16	99	99	Measuring angles
16	99	98	Changing decimals to common fractions
21.5	98	98	Division, fractions
21.5	98	97	Rounding off decimals
21.5	98	97	Division, mixed numbers
21.5	98	97	Multiplication, whole numbers
24.5	97	96	Multiplication, fractions
24.5	97	96	Multiplication, mixed numbers
26.5	96	95	Reducing mixed numbers to simplest form
26.5	96	95	Improper fractions, mixed numbers
28	93	93	Acute and obtuse angles
29.5	91.9	91	Rounding numbers
29.5	91.9	91	Using $\pi$
31.5	91.8	89	Finding length of unknown side of right triangle
31.5	91.8	90	Circumference using $C = \pi d = 2\pi r$
33	88.8	87	Dividing whole numbers and decimals by 10, 100, etc.
34.5	83.8	83	Simple algebraic equation with one unknown
34.5	83.8	83	Ratio and proportion
36	85.9	85	Multiplying whole numbers and decimals by 10, 100, etc.
37	84.5	82	Square root
38	82.8	82	Comparing fractions
39	81.4	79	Squaring a number
40	78.6	77	Reading large numbers
41	76.1	75	Area of circle using $A = \pi r^2$
42	74.2	72	Area of circle
43.5	73.2	71	Area of square
43.5	73.2	71	Area of rectangle
45	72.4	71	Averages
46	70.1	68	Meaning of percentage
47	68.8	66	Finding what part one number is of another
48	67.7	65	Area of triangle
49	67	65	Finding a number when a fractional part of it is known
50	65.6	63	Area of parallelogram
51.5	60.8	59	Finding per cent of a number
51.5	60.8	59	Changing per cent to decimals
53	59.4	57	Area of trapezoid
54	58.8	57	Changing decimals to per cents
56	57.7	56	Finding what per cent one number is of another
56	57.7	56	Changing common fractions to per cents
56	57.7	56	Changing per cents to common fractions
58	52.6	51	Finding a number when a per cent of it is known
59	48.5	47	Volume of rectangular solid
60.5	46.4	45	Volume of cube
60.5	46.4	45	Volume of cylinder
62	40.2	39	Volume of cone
63.5	38.1	37	Volume of sphere
63.5	38.1	37	Volume of pyramid
65	37.8	37	Temperature conversion
66	31.6	31	Liquid measure

TABLE 28  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING MACHINE TOOL DIE STUDENT

RANK	PERCENT	NUMBER	SKILL
1	87	80	Finding length of unknown side of right triangle
2	86.6	84	Measuring angles
3	86.5	83	Acute and obtuse angles
4	84.5	82	Changing common fractions to decimals
5	84.1	74	Finding a number when a fractional part of it is known
6	82.3	77	Changing decimals to common fractions
7	81.3	74	Square root
8	81	68	Finding a number when a per cent of it is known
9.5	80.9	72	Finding what part one number is of another
9.5	80.9	76	Ratio and proportion
11	80.5	70	Simple algebraic equation with one unknown
12	79.5	62	Volume of cone
13	79.1	68	Finding what per cent one number is of another
14	78.8	67	Changing per cents to common fractions
15	78.6	66	Area of trapezoid
16.5	78.2	61	Volume of sphere
16.5	78.2	61	Volume of pyramid
18	77.7	73	Division, mixed numbers
19	77.6	76	Division, fractions
20	76.7	66	Changing common fractions to per cents
21	76.6	72	Circumference using $C = \pi d = 2\pi r$
22	76.7	66	Area of triangle
23	76.5	75	Reading, writing decimals
24	76.2	61	Volume of cylinder
26.5	75.6	65	Changing per cent to decimals
26.5	75.6	65	Changing decimals to per cents
26.5	75.6	65	Area of parallelogram
26.5	75.6	59	Volume of rectangular solid
29	75.5	71	Decimal equivalents
30	75.3	64	Finding per cent of a number
31	75	72	Multiplication, fractions
32	74.7	65	Meaning of percentage
33	74.2	66	Area of circle
34	73.7	70	Division of decimals
35.5	73.4	69	Multiplication, mixed numbers
35.5	73.4	58	Temperature conversion
37	73.3	66	Comparing fractions
38	71.8	56	Volume of cube
39	71.1	64	Area of circle using $A = \pi r^2$
40	70.5	67	Micrometer reading
41.5	70.2	66	Using $\pi$
41.5	70.2	66	Improper fractions, mixed numbers
43	68.5	61	Area of rectangle
44	68.4	65	Reducing mixed numbers to simplest form
45	68	66	Rounding off decimals
46	67	61	Squaring a number
47	66.3	65	Subtraction, fractions
48	66	64	Reducing fractions to lowest terms
49	65.8	52	Liquid measure
50	65.6	63	Addition, mixed numbers
51	65.3	62	Subtraction, mixed numbers
52	65.2	58	Area of square
53	64.8	59	Dividing whole numbers and decimals by 10,100,etc.
54	64.3	63	Addition, fractions
55	63.2	60	Multiplication of decimals
56	61.7	58	Reading a rule
57	56.3	49	Averages
58	54.8	51	Multiplying whole numbers and decimals by 10,100,etc.
59.5	43.2	41	Addition of decimals
59.5	43.2	41	Subtraction of decimals
61	40.2	39	Division, whole numbers
62	38.9	35	Rounding numbers
63	33	29	Reading large numbers
64	29.9	29	Multiplication, whole numbers
65	25.8	25	Subtraction, whole numbers
66	23.7	23	Addition, whole numbers



TABLE 29

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF MASONRY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	100	26	Subtraction, whole numbers
2	100	26	Multiplication, whole numbers
2	100	26	Addition, whole numbers
4	96.2	25	Division, whole numbers
5	92.3	24	Reading a rule
6	92	23	Rounding numbers
7	88.5	20	Area of square
8	83.3	20	Rounding off decimals
9.5	80	20	Addition, fractions
9.5	80	20	Subtraction, fractions
11	79.2	19	Multiplication, fractions
12	76.9	20	Reading large numbers
13.5	79.2	19	Division, fractions
13.5	79.2	19	Reducing fractions to lowest terms
15.5	76	17	Area of rectangle
15.5	76	19	Reducing mixed numbers to simplest form
17	75	18	Reading, writing decimals
18	73.1	19	Meaning of percentage
20.5	72	18	Subtraction, mixed numbers
20.5	72	18	Addition, mixed numbers
20.5	72	18	Multiplication, mixed numbers
20.5	72	19	Area of circle
23	70.8	17	Squaring a number
25	68	17	Area of triangle
25	68	17	Division, mixed numbers
25	68	20	Measuring angles
27	65.4	20	Ratio and proportion
28	65.2	15	Changing common fractions to decimals
29	63.6	14	Addition of decimals
30	62.5	15	Averages
31	60.9	14	Finding per cent of a number
32	58.3	14	Improper fractions, mixed numbers
33.5	56.5	13	Multiplication of decimals
33.5	56.5	13	Subtraction of decimals
35.5	56	18	Volume of cube
35.5	56	19	Finding length of unknown side of right triangle
37	54.5	12	Division of decimals
40	54.2	13	Comparing fractions
40	54.2	13	Finding what part one number is of another
40	54.2	18	Area of circle using $A = \pi r^2$
40	54.2	13	Finding a number when a fractional part of it is known
40	54.2	13	Changing per cent to decimals
43.5	52.2	12	Multiplying whole numbers and decimals by 10, 100, etc.
43.5	52.2	12	Changing decimals to per cents
45	50	12	Finding what per cent one number is of another
46	47.8	11	Square root
48.5	45.8	11	Finding a number when a per cent of it is known
48.5	45.8	11	Changing common fractions to per cents
48.5	45.8	13	Liquid measure
48.5	45.8	16	Circumference using $C = \pi d = 2\pi r$
51	45.5	10	Decimal equivalents
52	44	17	Acute and obtuse angles
53	43.5	10	Dividing whole numbers and decimals by 10, 100, etc.
54.5	41.7	16	Using pi $\pi$
54.5	41.7	17	Area of parallelogram
56	40.9	9	Changing decimals to common fractions
57	40	16	Volume of rectangular solid
58	37.5	16	Volume of cylinder
59	33.3	8	Changing per cents to common fractions
60	31.8	15	Area of trapezoid
61	22.7	15	Volume of pyramid
62	20.8	16	Volume of sphere
63	17.4	14	Volume of cone
64	13	14	Simple algebraic equation with one unknown
65.5	0	0	Micrometer reading
65.5	0	12	Temperature conversion

TABLE 30

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING MASONRY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	90.9	20	Finding what part one number is of another
2	85.7	18	Finding what per cent one number is of another
3	83.3	20	Measuring angles
4	82.6	19	Finding length of unknown side of right triangle
5.5	81.8	18	Area of circle using $A = \pi r^2$
5.5	81.8	18	Finding a number when a fractional part of it is known
7	81	17	Finding a number when a per cent of it is known
8	80	20	Ratio and proportion
9	79.2	19	Area of circle
10	78.3	18	Volume of cube
11	76.9	20	Area of square
12	76.2	16	Changing common fractions to decimals
13	75	15	Changing decimals to per cents
14.5	73.9	17	Area of parallelogram
14.5	73.9	17	Acute and obtuse angles
17.5	72.7	16	Volume of cylinder
17.5	72.7	16	Using pi
17.5	72.7	16	Circumference using $C = \pi d = 2\pi r$
17.5	72.7	16	Square root
21	71.4	15	Changing common fractions to per cents
21	71.4	15	Finding per cent of a number
21	71.4	15	Area of trapezoid
24	70.8	17	Reducing mixed numbers to simplest form
24	70.8	17	Reducing fractions to lowest terms
24	70.8	17	Area of triangle
26	69.6	16	Volume of sphere
27.5	68.2	15	Volume of pyramid
27.5	68.2	15	Improper fractions, mixed numbers
29	68	17	Area of rectangle
32.5	66.7	14	Simple algebraic equation with one unknown
32.5	66.7	14	Changing per cent to decimals
32.5	66.7	16	Volume of rectangular solid
32.5	66.7	16	Subtraction, fractions
32.5	66.7	16	Multiplication, fractions
32.5	66.7	16	Division, fractions
37	65.2	15	Meaning of percentage
37	65.2	15	Reading, writing decimals
37	65.2	15	Multiplication, mixed numbers
39	65	13	Division of decimals
40	63.6	14	Volume of cone
41	63.2	12	Decimal equivalents
42	61.9	13	Changing per cents to common fractions
43.5	60.9	14	Comparing fractions
43.5	60.9	14	Division, mixed numbers
45	59.1	13	Rounding off decimals
46	58.3	14	Addition, fractions
47.5	57.1	12	Multiplication of decimals
47.5	57.1	12	Temperature conversion
49	55.6	10	Changing decimals to common fractions
50.5	55	11	Multiplying whole numbers and decimals by 10,100,etc.
50.5	55	11	Dividing whole numbers and decimals by 10,100,etc.
52	54.2	13	Liquid measure
53	52.4	11	Micrometer reading
54	52.2	12	Squaring a number
55	50	11	Subtraction, mixed numbers
56	48	12	Reading a rule
57	47.6	10	Subtraction of decimals
58.5	46.2	12	Multiplication, whole numbers
58.5	46.2	12	Division, whole numbers
60	45.5	10	Addition, mixed numbers
61	42.9	9	Averages
62	38.1	8	Addition of decimals
63.5	32	8	Reading large numbers
63.5	32	8	Rounding numbers
65	30.8	8	Subtraction, whole numbers
66	23.1	6	Addition, whole numbers

TABLE 31  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF METAL TRADE TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
9.5	100	10	Addition, whole numbers
9.5	100	10	Subtraction, whole numbers
9.5	100	10	Multiplication, whole numbers
9.5	100	10	Division, whole numbers
9.5	100	10	Reducing fractions to lowest terms
9.5	100	10	Addition, fractions
9.5	100	10	Subtraction, fractions
9.5	100	10	Reducing mixed numbers to simplest form
9.5	100	10	Reading, writing decimals
9.5	100	10	Changing common fractions to decimals
9.5	100	10	Reading a rule
9.5	100	10	Measuring angles
9.5	100	10	Using $\pi$
9.5	100	10	Circumference using $C = \pi d = 2\pi r$
9.5	100	9	Changing decimals to common fractions
9.5	100	9	Decimal equivalents
9.5	100	8	Addition of decimals
9.5	100	8	Subtraction of decimals
23	90	9	Multiplication, fractions
23	90	9	Division, fractions
23	90	9	Improper fractions, mixed
23	90	9	Addition, mixed numbers
23	90	9	Subtraction, mixed numbers
23	90	9	Multiplication, mixed numbers
23	90	9	Squaring a number
23	90	9	Area of rectangle
23	90	9	Area of square
28.5	88.9	8	Rounding numbers
28.5	88.9	8	Rounding off decimals
30.5	87.5	7	Multiplication of decimals
30.5	87.5	7	Division of decimals
34.5	80	8	Reading large numbers
34.5	80	8	Division, mixed numbers
34.5	80	8	Area of circle
34.5	80	8	Acute and obtuse angles
34.5	80	8	Area of circle using $A = \pi r^2$
34.5	80	8	Area of triangle
38	77.8	7	Finding length of unknown side of right triangle
40.5	66.7	6	Comparing fractions
40.5	66.7	6	Changing per cent to decimals
40.5	66.7	6	Changing decimals to per cents
40.5	66.7	6	Micrometer reading
43.5	62.5	5	Dividing whole numbers and decimals by 10, 100, etc.
43.5	62.5	5	Meaning of percentage
47.5	60	6	Changing common fractions to per cents
47.5	60	6	Square root
47.5	60	6	Area of trapezoid
47.5	60	6	Area of parallelogram
47.5	60	6	Volume of cylinder
47.5	60	6	Volume of sphere
51	57.1	4	Multiplying whole numbers and decimals by 10, 100, etc.
53	55.6	5	Averages
53	55.6	5	Finding what part one number is of another
53	55.6	5	Simple algebraic equation with one unknown
57.5	50	5	Changing per cents to common fractions
57.5	50	5	Finding what per cent one number is of another
57.5	50	5	Volume of rectangular solid
57.5	50	5	Volume of cube
57.5	50	4	Volume of cone
57.5	50	4	Volume of pyramid
62	44.4	4	Finding per cent of a number
62	44.4	4	Finding a number when a per cent of it is known
62	44.4	4	Finding a number when a fractional part of it is known
64	25	2	Liquid measure
65	14.3	1	Ratio and proportion
66	12.5	1	Temperature conversion

TABLE 32  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING METAL TRADES STUDENT

RANK	PERCENT	NUMBER	SKILL
2.5	90	9	Improper fractions, mixed numbers
2.5	90	9	Reducing mixed numbers to simplest form
2.5	90	9	Acute and obtuse angles
2.5	90	9	Division, fractions
5	87.5	7	Division of decimals
11	80	8	Squaring a number
11	80	8	Using pi $\pi$
11	80	8	Circumference using $C=\pi d=2\pi r$
11	80	8	Multiplication, mixed numbers
11	80	8	Division, mixed numbers
11	80	8	Area of rectangle
11	80	8	Area of square
11	80	8	Multiplication, fractions
11	80	8	Area of triangle
11	80	8	Measuring angles
11	80	8	Changing common fractions to decimals
20	77.8	7	Volume of cube
20	77.8	7	Volume of cylinder
20	77.8	7	Changing decimals to common fractions
20	77.8	7	Decimal equivalents
20	77.8	7	Area of circle using $A=\pi r^2$
20	77.8	7	Area of parallelogram
20	77.8	7	Area of trapezoid
25	75	6	Volume of rectangular solid
25	75	6	Volume of sphere
25	75	6	Comparing fractions
27.5	71.4	5	Volume of cone
27.5	71.4	5	Volume of pyramid
30	70	7	Subtraction, mixed numbers
30	70	7	Area of circle
30	70	7	Subtraction, fractions
33.5	66.7	6	Finding length of unknown side of right triangle
33.5	66.7	6	Dividing whole numbers and decimals by 10, 100, etc.
33.5	66.7	6	Finding what per cent one number is of another
33.5	66.7	6	Square root
38	62.5	5	Finding a number when a per cent of it is known
38	62.5	5	Finding what part one number is of another
38	62.5	5	Finding a number when a fractional part of it is known
38	62.5	5	Multiplying whole numbers and decimals by 10, 100, etc.
38	62.5	5	Micrometer reading
45.5	60	6	Changing per cent to decimals
45.5	60	6	Changing decimals to per cents
45.5	60	6	Changing per cents to common fractions
45.5	60	6	Changing common fractions to per cents
45.5	60	3	Temperature conversion
45.5	60	3	Ratio and proportion
45.5	60	6	Reading a rule
45.5	60	6	Reducing fractions to lowest terms
45.5	60	6	Addition, fractions
45.5	60	6	Addition, mixed numbers
52.5	55.6	5	Reading, writing decimals
52.5	55.6	5	Rounding off decimals
52.5	55.6	5	Meaning of percentage
52.5	55.6	5	Simple algebraic equation with one unknown
56	50	4	Addition of decimals
56	50	4	Subtraction of decimals
56	50	4	Multiplication of decimals
59	44.4	4	Reading large numbers
59	44.4	4	Rounding numbers
59	44.4	4	Finding per cent of a number
61	40	4	Multiplication, whole numbers
62	33.3	2	Liquid measure
63	30	3	Division, whole numbers
64.5	20	2	Addition, whole numbers
64.5	20	2	Subtraction, whole numbers
66	25	2	Averages

TABLE 33

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF MILL AND CABINET MAKING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	96	24	Circumference using $C = \pi d = 2\pi r$
2	92.9	26	Measuring angles
3	92.3	24	Finding length of unknown side of right triangle
4	92	23	Area of circle using $A = \pi r^2$
5	90	18	Simple algebraic equation with one unknown
6.5	88.9	24	Multiplication, fractions
6.5	88.9	24	Division, fractions
8.5	87.5	21	Acute and obtuse angles
8.5	87.5	21	Area of triangle
10	87	20	Changing common fractions to decimals
11	85.7	18	Volume of cube
12	85.2	23	Subtraction, fractions
13.5	85	17	Volume of cone
13.5	85	17	Volume of pyramid
16	84	21	Square root
16	84	21	Using $\pi$
16	84	21	Division, mixed numbers
18	83.3	20	Area of circle
19	82	21	Improper fractions, mixed numbers
20.5	81.8	18	Area of parallelogram
20.5	81.8	18	Area of trapezoid
22.5	81.5	22	Subtraction, mixed numbers
22.5	81.5	22	Addition, fractions
24	81	17	Volume of rectangular solid
25	80.8	21	Reducing fractions to lowest terms
26.5	80	20	Changing decimals to common fractions
26.5	80	20	Comparing fractions
28.5	79.2	9	Reading, writing decimals
28.5	79.2	19	Rounding off decimals
30	77.8	14	Temperature conversion
31	76.9	20	Multiplication, mixed numbers
33	76.2	16	Ratio and proportion
33	76.2	16	Volume of cylinder
33	76.2	16	Volume of sphere
35.5	76	19	Area of rectangle
35.5	76	19	Reducing mixed numbers to simplest form
37	75	18	Decimal equivalents
38	73.7	14	Micrometer reading
39	74.1	20	Addition, mixed numbers
40	72	18	Changing common fractions to per cents
43	70.8	17	Changing per cent to decimals
43	70.8	17	Changing decimals to per cents
43	70.8	17	Changing per cents to common fractions
43	70.8	17	Averages
43	70.8	17	Finding per cent of a number
46	69.6	16	Finding a number when a fractional part of it is known
47	68	17	Squaring a number
48.5	65.2	15	Finding a number when a per cent of it is known
48.5	65.2	15	Finding what part one number is of another
50	65	13	Liquid measure
51	64	16	Area of square
52.5	60.9	14	Division of decimals
52.5	60.9	14	Finding what per cent one number is of another
54.5	56.5	13	Multiplication of decimals
54.5	56.5	13	Meaning of percentage
56	53.6	15	Reading a rule
57	50	13	Division, whole numbers
58.5	45.8	11	Addition of decimals
58.5	45.8	11	Subtraction of decimals
60.5	43.5	10	Multiplying whole numbers and decimals by 10,100,etc.
60.5	43.5	10	Dividing whole numbers and decimals by 10,100,etc.
62	44.4	12	Multiplication, whole numbers
63	44	11	Reading large numbers
64	38.5	10	Rounding numbers
65.5	25.9	7	Addition, whole numbers
65.5	25.9	7	Subtraction, whole numbers

TABLE 34  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING MILL & CABINET MAKING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	96	24	Circumference using $C = \pi d = 2\pi r$
2	92.9	26	Measuring angles
3	92.3	24	Finding length of unknown side of right triangle
4	92	23	Area of circle using $A = \pi r^2$
5	90	18	Simple algebraic equation with one unknown
6.5	88.9	24	Multiplication, fractions
6.5	88.9	24	Division, fractions
8.5	87.5	21	Acute and obtuse angles
8.5	87.5	21	Area of triangle
10	87	20	Changing common fractions to decimals
11	85.7	18	Volume of cube
12	85.2	23	Subtraction, fractions
13.5	85	17	Volume of cone
13.5	85	17	Volume of pyramid
16	84	21	Square root
16	84	21	Using $\pi$
16	84	21	Division, mixed numbers
18	83.3	20	Area of circle
19	82	21	Improper fractions, mixed numbers
20.5	81.8	18	Area of parallelogram
20.5	81.8	18	Area of trapezoid
22.5	81.5	22	Subtraction, mixed numbers
22.5	81.5	22	Addition, fractions
24	81	17	Volume of rectangular solid
25	80.8	21	Reducing fractions to lowest terms
26.5	80	20	Changing decimals to common fractions
26.5	80	20	Comparing fractions
28.5	79.2	19	Reading, writing decimals
28.5	79.2	19	Rounding off decimals
30	77.8	14	Temperature conversion
31	76.9	20	Multiplication, mixed numbers
33	76.2	16	Ratio and proportion
33	76.2	16	Volume of cylinder
33	76.2	16	Volume of sphere
35.5	76	19	Area of rectangle
35.5	76	19	Reducing mixed numbers to simplest form
37	75	18	Decimal equivalents
38	73.7	14	Micrometer reading
39	74.1	20	Addition, mixed numbers
40	72	18	Changing common fractions to per cents
43	70.8	17	Changing per cent to decimals
43	70.8	17	Changing decimals to per cents
43	70.8	17	Changing per cents to common fractions
43	70.8	17	Averages
43	70.8	17	Finding per cent of a number
46	69.6	16	Finding a number when a fractional part of it is known
47	68	17	Squaring a number
48.5	65.2	15	Finding a number when a per cent of it is known
48.5	65.2	15	Finding what part one number is of another
50	65	13	Liquid measure
51	64	16	Area of square
52.5	60.9	14	Division of decimals
52.5	60.9	14	Finding what per cent one number is of another
54.5	56.5	13	Multiplication of decimals
54.5	56.5	13	Meaning of percentage
56	53.6	15	Reading a rule
57	50	13	Division, whole numbers
58.5	45.8	11	Addition of decimals
58.5	45.8	11	Subtraction of decimals
60.5	43.5	10	Multiplying whole numbers and decimals by 10,100, etc.
60.5	43.5	10	Dividing whole numbers and decimals by 10,100, etc.
62	44.4	12	Multiplication, whole numbers
63	44	11	Reading large numbers
64	38.5	10	Rounding numbers
65.5	25.9	7	Addition, whole numbers
65.5	25.9	7	Subtraction, whole numbers

TABLE 35

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF PRINTING GRAPHIC ARTS TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	47	Multiplication, whole numbers
2	97.9	46	Division, whole numbers
3.5	97.8	44	Addition, whole numbers
3.5	97.8	45	Subtraction, whole numbers
5	95.7	45	Reading a rule
6.5	88.9	40	Addition, fractions
6.5	88.9	40	Subtraction, fractions
8	86.4	38	Multiplication, fractions
9	83	39	Liquid measure
10	82.2	37	Ratio and proportion
11.5	78.3	36	Division, fractions
11.5	78.3	36	Addition, mixed numbers
13.5	77.8	35	Subtraction, mixed numbers
13.5	77.8	35	Reading, writing decimals
15	75.6	34	Multiplication, mixed numbers
16	75	33	Reducing fractions to lowest terms
17	74.5	35	Micrometer reading
18	73.2	33	Meaning of percentage
19	72.7	32	Reducing mixed numbers to simplest form
20	70.5	31	Division, mixed numbers
21	68.9	31	Changing common fractions
22	68.2	30	Improper fractions, mixed
23	65.1	28	Reading large numbers
25	64.4	29	Rounding numbers
25	64.4	29	Rounding off decimals
25	64.4	29	Subtraction of decimals
27	63	29	Finding per cent of a number
28.5	62.2	28	Dividing whole numbers and decimals by 10, 100, etc.
28.5	62.2	28	Addition of decimals
38	60	27	Multiplication of decimals
31.5	59.1	26	Multiplying whole numbers and decimals by 10, 100, etc.
31.5	59.1	26	Averages
33	58.1	25	Changing decimals to common fractions
34	57.8	26	Division of decimals
35	55.6	25	Changing per cent to decimals
36	51.2	22	Decimal equivalents
37.5	50	22	Finding what per cent one number is of another
37.5	50	22	Comparing fractions
39	48.9	22	Changing decimals to per cents
40	48.8	21	Finding a number when a per cent of it is known
41	46.7	21	Changing common fractions to per cents
42	44.2	19	Finding what part one number is of another
43	40.9	18	Changing per cents to common fractions
44	38.6	17	Measuring angles
45	36.6	15	Finding a number when a fractional part of it is known
46	30.2	13	Simple algebraic equation with one unknown
47	27.9	12	Area of square
48	25.6	11	Area of rectangle
49	22.7	10	Temperature conversion
50	22.2	10	Squaring a number
51	18.6	8	Area of circle
52	13.6	6	Acute and obtuse angles
53	11.6	5	Area of triangle
54	11.1	5	Square root
55	9.3	4	Area of parallelogram
57	7	3	Volume of rectangular solid
57	7	3	Volume of cube
57	7	3	Trapezoid
59	6.8	3	Finding length of unknown side of right triangle
60	4.7	2	Volume of cylinder
61	2.4	1	Area of circle using $A = \pi r^2$
62.5	2.3	1	Circumference using $C = \pi d = 2\pi r$
62.5	2.3	1	Using $\pi$
65.5	0	0	Volume of cone
65	0	0	Volume of sphere
65	0	0	Volume of pyramid

TABLE 36

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING PRINTING GRAPHIC ARTS STUDENT

RANK	PERCENT	NUMBER	SKILL
1	86.4	38	Multiplication, fractions
2	82.2	37	Division, fractions
3	81.4	35	Micrometer reading
4	80.4	37	Subtraction, fractions
5.5	79.5	31	Improper fractions, mixed numbers
5.5	79.5	31	Reducing mixed numbers to simplest form
7	77.8	35	Addition, fractions
8	77.3	34	Ratio and proportion
9.5	73.2	30	Division, mixed numbers
9.5	73.2	30	Reducing fractions to lowest terms
11	73	27	Comparing fractions
12	70.9	29	Changing common fractions to decimals
13	70.6	24	Finding a number when a fractional part of it is known
14.5	69.8	30	Subtraction, mixed numbers
14.5	69.8	30	Multiplication, mixed numbers
16	67.6	25	Changing decimals to per cents
17	67.4	29	Addition, mixed numbers
19	66.7	24	Measuring angles
19	66.7	22	Simple algebraic equation with one unknown
19	66.7	24	Finding what part one number is of another
21	65.7	23	Finding what per cent one number is of another
22.5	64.5	20	Area of circle
22.5	64.5	20	Square root
24	63.9	23	Finding a number when a per cent of it is known
25	63.3	19	Area of trapezoid
26.5	62.2	23	Decimal equivalents
26.5	62.2	23	Changing common fractions to per cents
28	62.1	18	Volume of cube
29	61.5	24	Finding per cent of a number
31.5	60	18	Using pi $\pi$
31.5	60	18	Area of parallelogram
31.5	60	18	Area of triangle
31.5	60	21	Changing per cents to common fractions
34	58.7	27	Reading a rule
37.5	58.6	17	Area of circle using $A = \pi r^2$
37.5	58.6	17	Volume of cylinder
37.5	58.6	17	Volume of sphere
37.5	58.6	17	Volume of cone
37.5	58.6	17	Volume of pyramid
37.5	58.6	17	Volume of rectangular solid
41	58.1	18	Finding length of unknown side of right triangle
42	57.9	22	Changing per cent to decimals
43	57.5	23	Meaning of percentage
44	56.8	21	Changing decimals to common fractions
45	56.7	17	Circumference using $C = \pi d = 2\pi r$
46	56.3	18	Acute and obtuse angles
47	56.1	23	Division of decimals
48	55.8	24	Reading, writing decimals
49	55	22	Rounding off decimals
50	54.5	18	Temperature conversion
51	54.3	19	Area of rectangle
52	52.2	24	Liquid measure
53	51.4	18	Squaring a number
54	51.3	20	Averages
55	51.2	21	Dividing whole numbers and decimals by 10, 100, etc.
56	50	17	Area of square
57	47.5	19	Multiplication of decimals
58	46.3	19	Multiplying whole numbers and decimals by 10,100,etc.
59	45.7	21	Division, whole numbers
60	41.3	19	Multiplication, whole numbers
61	36.6	15	Subtraction of decimals
62	35.4	16	Rounding numbers
63	34.1	14	Addition of decimals
64	33.3	15	Subtraction, whole numbers
65	24.4	11	Addition, whole numbers
66	19	8	Reading large numbers



TABLE 37  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF PLUMBING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
11	100	16	Rounding numbers
11	100	16	Addition, whole numbers
11	100	16	Subtraction, whole numbers
11	100	16	Multiplication, whole numbers
11	100	16	Division, whole numbers
11	100	14	Finding length of unknown side of right triangle
11	100	15	Using pi $\pi$
11	100	15	Circumference using $C = \pi d = 2\pi r$
11	100	16	Area of circle using $A = \pi r^2$
11	100	16	Area of rectangle
11	100	15	Area of square
11	100	15	Area of circle
11	100	15	Volume of rectangular solid
11	100	16	Reading a rule
11	100	16	Volume of cylinder
11	100	15	Measuring angles
11	100	14	Area of triangle
11	100	16	Addition, fractions
11	100	16	Subtraction, fractions
11	100	16	Addition, mixed numbers
11	100	16	Subtraction, mixed numbers
26	93.8	15	Averages
26	93.8	15	Reducing fractions to lowest terms
26	93.8	15	Liquid measure
26	93.8	15	Temperature conversion
26	93.8	15	Comparing fractions
26	93.8	15	Changing common fractions to decimals
26	93.8	15	Addition of decimals
26	93.8	15	Volume of cube
26	93.8	15	Meaning of percentage
31.5	93.3	14	Square root
31.5	93.3	14	Multiplying whole numbers and decimals by 10, 100, etc.
33	92.9	13	Area of parallelogram
34	87.7	12	Finding per cent of a number
38.5	87.5	14	Rounding off decimals
38.5	87.5	14	Division, fractions
38.5	87.5	14	Subtraction of decimals
38.5	87.5	14	Multiplication of decimals
38.5	87.5	14	Division of decimals
38.5	87.5	14	Changing decimals to common fractions
38.5	87.5	14	Multiplication, mixed numbers
38.5	87.5	14	Reading, writing decimals
44	86.7	13	Dividing whole numbers and decimals by 10, 100, etc.
44	86.7	13	Reducing mixed numbers to simplest form
44	86.7	13	Acute and obtuse angles
48	81.3	13	Changing per cent to decimals
48	81.3	13	Changing decimals to per cents
48	81.3	13	Decimal equivalents
48	81.3	13	Multiplication, fractions
48	81.3	13	Squaring a number
51	78.6	11	Area of trapezoid
53	75	12	Improper fractions, mixed numbers
53	75	12	Reading large numbers
53	75	12	Division, mixed numbers
55	73.3	11	Volume of sphere
56	71.4	10	Finding what per cent one number is of another
57	69.2	9	Volume of pyramid
58	68.8	11	Changing common fractions to per cents
59	66.7	10	Simple algebraic equation with one unknown
60	64.3	9	Ratio and proportion
61	61.5	8	Volume of cone
62	60	9	Changing per cents to common fractions
63	57.1	8	Finding a number when a fractional part of it is known
64.5	53.8	7	Finding a number when a per cent of it is known
64.5	53.8	7	Finding what part one number is of another
66	42.9	6	Micrometer reading

TABLE 38  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING PLUMBING STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	93.3	14	Volume of sphere
1.5	93.3	14	Changing decimals to per cents
4.5	92.9	13	Finding length of unknown side of right triangle
4.5	92.9	13	Decimal equivalents
4.5	92.9	13	Changing per cents to common fractions
4.5	92.9	13	Area of trapezoid
8.5	92.3	12	Volume of cone
8.5	92.3	12	Volume of pyramid
8.5	92.3	12	Finding what per cent one number is of another
8.5	92.3	12	Finding a number when a fractional part of it is known
11.5	91.7	11	Finding what part one number is of another
11.5	91.7	11	Finding a number when a percent of it is known
14	87.5	14	Volume of cube
14	87.5	14	Volume of cylinder
14	87.5	14	Temperature conversion
18.5	86.7	13	Acute and obtuse angles
18.5	86.7	13	Simple algebraic equation with one unknown
18.5	86.7	13	Changing common fractions to per cents
18.5	86.7	13	Meaning of percentage
18.5	86.7	13	Changing per cent to decimals
18.5	86.7	13	Changing decimals to common fractions
24	85.7	12	Ratio and proportion
24	85.7	12	Division of decimals
24	85.7	12	Square root
24	85.7	12	Area of parallelogram
24	85.7	12	Area of triangle
27	84.6	11	Finding per cent of a number
28	81.8	9	Micrometer reading
31	81.3	13	Reducing fractions to lowest terms
31	81.3	13	Area of circle using $A = \pi r^2$
31	81.3	13	Liquid measure
31	81.3	13	Rounding off decimals
31	81.3	13	Changing common fractions to decimals
35.5	80	12	Volume of rectangular solid
35.5	80	12	Circumference using $C = \pi d = 2\pi r$
35.5	80	12	Averages
35.5	80	12	Measuring angles
39.5	78.6	11	Dividing whole numbers and decimals by 10,100,etc.
39.5	78.6	11	Addition of decimals
39.5	78.6	11	Subtraction of decimals
39.5	78.6	11	Multiplication of decimals
43.5	75	12	Improper fractions, mixed numbers
43.5	75	12	Multiplication, mixed numbers
43.5	75	12	Division, mixed numbers
43.5	75	12	Using pi $\pi$
47	73.3	11	Area of circle
47	73.3	11	Squaring a number
47	73.3	11	Reducing mixed numbers to simplest form
49	71.4	10	Multiplying whole numbers and decimals by 10,100,etc.
52.5	68.8	11	Area of rectangle
52.5	68.8	11	Addition, mixed numbers
52.5	68.8	11	Subtraction, mixed numbers
52.5	68.8	11	Multiplication, fractions
52.5	68.8	11	Division, fractions
52.5	68.8	11	Rounding numbers
57	66.7	10	Reading a rule
57	66.7	10	Comparing fractions
57	66.7	10	Area of square
59	62.5	10	Reading, writing decimals
60	56.3	9	Subtraction, fractions
61	50	8	Addition, fractions
62	46.7	7	Reading large numbers
63	43.8	7	Division, whole numbers
64	37.5	6	Multiplication, whole numbers
65	31.3	5	Subtraction, whole numbers
66	25	4	Addition, whole numbers

TABLE 39  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF SHEET METAL TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
11.5	100	16	Using pi $\pi$
11.5	100	16	Circumference using $C = \pi d = 2\pi r$
11.5	100	16	Area of circle using $A = \pi r^2$
11.5	100	16	Area of rectangle
11.5	100	16	Area of square
11.5	100	16	Reading, writing decimals
11.5	100	16	Rounding off decimals
11.5	100	16	Changing common fractions to decimals
11.5	100	16	Changing decimals to common fractions
11.5	100	16	Decimal equivalents
11.5	100	16	Addition of decimals
11.5	100	16	Multiplication of decimals
11.5	100	16	Reading a rule
11.5	100	16	Rounding numbers
11.5	100	16	Multiplication, whole numbers
11.5	100	16	Addition, whole numbers
11.5	100	16	Division, whole numbers
11.5	100	16	Reducing fractions to lowest terms
11.5	100	16	Addition, fractions
11.5	100	16	Addition, mixed numbers
11.5	100	16	Reducing mixed numbers to simplest form
11.5	100	16	Multiplication, fractions
30.5	93.8	15	Acute and obtuse angles
30.5	93.8	15	Measuring angles
30.5	93.8	15	Finding length of unknown side of right triangle
30.5	93.8	15	Area of parallelogram
30.5	93.8	15	Area of triangle
30.5	93.8	15	Area of circle
30.5	93.8	15	Reading large numbers
30.5	93.8	15	Subtraction of decimals
30.5	93.8	15	Division, fractions
30.5	93.8	15	Subtraction, fractions
30.5	93.8	15	Dividing whole numbers and decimals by 10,100,etc.
30.5	93.8	15	Subtraction, whole numbers
30.5	93.8	15	Division of decimals
30.5	93.8	15	Improper fractions, mixed numbers
30.5	93.8	15	Subtraction, mixed numbers
30.5	93.8	15	Multiplication, mixed numbers
39	93.3	14	Comparing fractions
41	87.5	14	Volume of cylinder
41	87.5	14	Division, mixed numbers
41	87.5	14	Multiplying whole numbers and decimals by 10,100,etc
46	86.7	13	Volume of cone
46	86.7	13	Volume of pyramid
46	86.7	13	Squaring a number
46	86.7	13	Micrometer reading
46	86.7	13	Area of trapezoid
46	86.7	13	Volume of cube
46	86.7	13	Meaning of percentage
50	85.7	12	Square root
53.5	80	12	Volume of sphere
53.5	80	12	Changing per cent to decimals
53.5	80	12	Finding what part one number is of another
53.5	80	12	Ratio and proportion
53.5	80	12	Simple algebraic equation with one unknown
53.5	80	12	Volume of rectangular solid
57	78.6	11	Averages
58.5	71.4	10	Liquid measure
58.5	71.4	10	Finding a number when a fractional part of it is known
60.5	66.7	10	Changing decimals to per cents
60.5	66.7	10	Finding per cent of a number
63	60	9	Finding what per cent one number is of another
63	60	9	Changing per cents to common fractions
63	60	9	Changing common fractions to per cents
65	50	7	Finding a number when a per cent of it is known
66	46.7	7	Temperature conversion

TABLE 40  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING SHEETMETAL STUDENT

RANK	PERCENT	NUMBER	SKILL
1	92.3	12	Temperature conversion
2	91.7	11	Liquid measure
4.5	87.5	14	Finding length of unknown side of right triangle
4.5	87.5	14	Using $\pi$
4.5	87.5	14	Circumference using $C = \pi d = 2\pi r$
4.5	87.5	14	Area of circle using $A = \pi r^2$
8.5	86.7	13	Square root
8.5	86.7	13	Volume of cone
8.5	86.7	13	Volume of pyramid
8.5	86.7	13	Area of trapezoid
11	85.5	12	Ratio and proportion
12	87.7	14	Measuring angles
13	83.3	10	Finding what per cent one number is of another
15	81.3	13	Acute and obtuse angles
15	81.3	13	Area of circle
15	81.3	13	Volume of cylinder
20.5	80	12	Changing common fractions to decimals
20.5	80	12	Decimal equivalents
20.5	80	12	Multiplication, fractions
20.5	80	12	Reducing mixed numbers to simplest form
20.5	80	12	Simple algebraic equation with one unknown
20.5	80	12	Volume of rectangular solid
20.5	80	12	Volume of cube
20.5	80	12	Volume of sphere
25	78.6	11	Finding what part one number is of another
26.5	75	12	Area of parallelogram
26.5	75	12	Area of triangle
30	73.3	11	Changing decimals to common fractions
30	73.3	11	Micrometer reading
30	73.3	11	Squaring a number
30	73.3	4	Division, fractions
30	73.3	11	Reading, writing decimals
33	71.4	10	Comparing fractions
34	68.8	11	Area of rectangle
37	66.7	10	Addition, mixed numbers
37	66.7	10	Addition, fractions
37	66.7	10	Improper fractions, mixed numbers
37	66.7	10	Reading a rule
37	66.7	8	Finding a number when a per cent of it is known
40	64.3	9	Multiplication, mixed numbers
41.5	62.5	10	Area of square
41.5	62.5	10	Rounding off decimals
45.5	60	9	Reducing fractions to lowest terms
45.5	60	9	Subtraction, mixed numbers
45.5	60	9	Subtraction, fractions
45.5	60	9	Multiplication of decimals
45.5	60	9	Meaning of percentage
45.5	60	9	Changing per cent to decimals
49.5	58.3	7	Changing decimals to per cents
49.5	58.3	7	Changing per cents to common fractions
51.5	57.1	8	Finding a number when a fractional part of it is known
51.5	57.1	8	Division, mixed numbers
53	53.3	8	Addition of decimals
54.5	46.7	7	Subtraction of decimals
54.5	46.7	7	Division, whole numbers
56	43.8	7	Multiplying whole numbers and decimals by 10,100,etc.
59	50	6	Changing common fractions to per cents
59	50	6	Finding per cent of a number
59	50	8	Division of decimals
59	50	8	Dividing whole numbers and decimals by 10,100,etc.
59	50	7	Averages
63	40	6	Reading large numbers
63	40	6	Rounding numbers
63	40	6	Multiplication, whole numbers
65.5	26.7	4	Addition, whole numbers
65.5	26.7	4	Subtraction, whole numbers

TABLE 41  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF T & I OTHERS. TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	100	34	Subtraction, whole numbers
1.5	100	34	Addition, whole numbers
3.5	97.1	33	Multiplication, whole numbers
3.5	97.1	33	Reading, writing decimals
5	91.7	33	Division, whole numbers
7	91.2	31	Subtraction of decimals
7	91.2	31	Addition of decimals
7	91.2	31	Meaning of percentage
10	88.2	30	Averages
10	88.2	30	Multiplying whole numbers and decimals by 10,100,etc.
10	88.2	30	Changing common fractions to decimals
12	87.9	29	Reading a rule
13.5	85.3	29	Rounding numbers
13.5	85.3	29	Reading large numbers
17	82.4	28	Finding per cent of a number
17	82.4	28	Multiplication of decimals
17	82.4	28	Dividing whole numbers and decimals by 10,100,etc.
17	82.4	28	Changing per cent to decimals
17	82.4	28	Rounding off decimals
22	79.4	27	Addition, mixed numbers
22	79.4	27	Subtraction, fractions
22	79.4	27	Addition, fractions
22	79.4	27	Changing decimals to per cents
22	79.4	27	Subtraction, mixed numbers
26	76.5	26	Multiplication, fractions
26	76.5	26	Division of decimals
26	76.5	26	Decimal equivalents
28	75.8	25	Reducing fractions to lowest terms
29.5	73.5	25	Multiplication, mixed numbers
29.5	73.5	25	Changing decimals to common fractions
31.5	72.7	24	Liquid measure
31.5	72.7	24	Reducing mixed numbers to simplest form
33.5	70.6	24	Division, fractions
33.5	70.6	24	Division, mixed numbers
35	69.7	23	Area of square
36.5	67.6	23	Improper fractions, mixed numbers
36.5	67.6	23	Comparing fractions
38	66.7	22	Area of rectangle
40	64.7	22	Changing per cents to common fractions
40	64.7	22	Finding what per cent one number is of another
40	64.7	22	Changing common fractions to per cents
42.5	57.6	19	Volume of rectangular solid
42.5	57.6	19	Measuring angles
44.5	55.9	19	Finding a number when a per cent of it is known
44.5	55.9	19	Finding what part one number is of another
47.5	54.5	18	Volume of cube
47.5	54.5	18	Ratio and proportion
47.5	54.5	18	Area of circle
47.5	54.5	18	Finding a number when a fractional part of it is known
50	46.9	15	Volume of cylinder
51.5	45.5	15	Area of triangle
51.5	45.5	15	Area of circle using $A = \pi r^2$
53	45.2	14	Finding length of unknown side of right triangle
55	42.4	14	Using $\pi$
55	42.4	14	Circumference using $C = \pi d = 2\pi r$
55	42.4	14	Squaring a number
57	40.6	13	Acute and obtuse angles
58	34.4	11	Micrometer reading
59	34.2	11	Temperature conversion
60	31.3	10	Simple algebraic equation with one unknown
61	30.3	10	Square root
62	27.3	9	Area of parallelogram
64.5	24.2	8	Volume of pyramid
64.5	24.2	8	Volume of cone
64.5	24.2	8	Volume of sphere
64.5	24.2	8	Area of trapezoid

TABLE 42

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING T & I OTHERS STUDENT

RANK	PERCENT	NUMBER	SKILL
1	93.3	28	Area of triangle
2	93.1	27	Area of circle using $A = \pi r^2$
3.5	89.3	28	Using $\pi$
3.5	89.3	25	Circumference using $C = \pi d = 2\pi r$
5	87.1	27	Area of circle
7	86.7	26	Temperature conversion
7	86.7	26	Volume of cylinder
7	86.7	26	Volume of sphere
9.5	86.2	25	Volume of cone
9.5	86.2	25	Area of trapezoid
11	85.2	23	Square root
12	84.4	27	Changing decimals to common fractions
13.5	83.3	25	Volume of pyramid
13.5	83.3	25	Finding length of unknown side of right triangle
15.5	82.4	28	Changing common fractions to decimals
15.5	82.4	28	Reducing fractions to lowest terms
18	80.6	25	Finding what per cent one number is of another
18	80.6	25	Finding a number when a per cent of it is known
18	80.6	25	Finding a number when a fractional part of it is known
21	80	24	Finding what part one number is of another
21	80	24	Volume of rectangular solid
21	80	24	Area of parallelogram
23	78.1	25	Measuring angles
25	76.7	23	Ratio and proportion
25	76.7	23	Volume of cube
25	76.7	23	Acute and obtuse angles
29.5	76.5	26	Division, mixed numbers
29.5	76.5	26	Comparing fractions
29.5	76.5	26	Improper fractions, mixed numbers
29.5	76.5	26	Reducing mixed numbers to simplest form
29.5	76.5	26	Addition, mixed numbers
29.5	76.5	26	Subtraction, mixed numbers
33	75.8	25	Meaning of percentage
34.5	75	21	Micrometer reading
34.5	75	24	Decimal equivalents
36.5	74.2	23	Changing per cents to common fractions
36.5	74.2	23	Division of decimals
39	73.5	25	Addition, fractions
39	73.5	25	Division, fractions
39	73.5	25	Multiplication, mixed numbers
41	71.9	23	Finding per cent of a number
42.5	71	22	Changing per cent to decimals
42.5	71	22	Changing common fractions to per cents
44.5	70.6	24	Subtraction, fractions
44.5	70.6	24	Multiplication, fractions
46	69	20	Simple algebraic equation with one unknown
47.5	67.6	23	Averages
47.5	67.6	23	Reading, writing decimals
49	66.7	20	Changing decimals to per cents
50	65.6	21	Reading a rule
52.5	64.5	20	Area of square
52.5	64.5	20	Multiplication of decimals
53	64.7	22	Rounding off decimals
54	63.3	19	Area of rectangle
55	60.6	20	Liquid measure
56.5	59.4	19	Subtraction of decimals
56.5	59.4	19	Dividing whole numbers and decimals by 10,100,etc.
58	58.8	20	Division, whole numbers
59	56.3	18	Addition of decimals
60	55.2	16	Squaring a number
61	51.5	17	Multiplying whole numbers and decimals by 10,100,etc.
62	42.4	14	Rounding numbers
63	41.2	14	Multiplication, whole numbers
64	27.3	9	Reading large numbers
65	26.5	9	Subtraction, whole numbers
66	23.5	8	Addition, whole numbers

TABLE 43  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF WELDING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	100	39	Subtraction, fractions
2	100	39	Addition, fractions
2	100	39	Reading a rule
4	97.4	37	Reducing fractions to lowest terms
5	97.3	36	Measuring angles
6	94.9	37	Subtraction, whole numbers
8	94.9	37	Multiplication, fractions
8	94.9	37	Division, fractions
8	94.9	37	Addition, whole numbers
10	94.6	35	Addition, mixed numbers
11.5	92.3	36	Division, whole numbers
11.5	92.3	36	Multiplication, whole numbers
13	91.9	34	Subtraction, mixed numbers
14.5	86.8	33	Reducing mixed numbers to simplest form
14.5	86.8	33	Reading, writing decimals
16.5	86.5	32	Multiplication, mixed numbers
16.5	86.5	32	Division, mixed numbers
18	84.6	33	Changing decimals to common fractions
19	81.6	31	Improper fractions, mixed numbers
20.5	81.1	30	Comparing fractions
20.5	81.1	30	Circumference using $C = \pi d = 2\pi r$
22	79.5	31	Decimal equivalents
25	78.9	30	Meaning of percentage
25	78.9	30	Changing common fractions to decimals
25	78.9	30	Multiplication of decimals
25	78.9	30	Division of decimals
25	78.9	30	Using pi $\pi$
28	18.4	29	Finding length of unknown side of right triangle
30	76.3	29	Subtraction of decimals
30	76.3	29	Addition of decimals
30	76.3	29	Area of square
32.5	75.7	28	Rounding off decimals
32.5	75.7	28	Area of rectangle
34	75	27	Dividing whole numbers and decimals by 10, 100, etc.
35.5	73	27	Area of circle using $A = \pi r^2$
35.5	73	27	Rounding numbers
37	72.2	26	Multiplying whole numbers and decimals by 10, 100, etc.
38	71.1	27	Area of circle
39	70.3	26	Acute and obtuse angles
40	69.4	25	Averages
41	64.9	24	Reading large numbers
42	59.5	22	Squaring a number
44.5	56.8	21	Area of parallelogram
44.5	56.8	21	Simple algebraic equation with one unknown
44.5	56.8	21	Changing per cents to common fractions
44.5	56.8	21	Changing decimals to per cents
47	55.6	20	Square root
49	54.1	20	Area of triangle
49	54.1	20	Finding per cent of a number
49	54.1	20	Changing per cent to decimals
51	52.8	19	Changing common fractions to per cents
52.5	48.6	18	Finding a number when a fractional part of it is known
52.5	48.6	18	Area of trapezoid
54	47.2	17	Temperature conversion
56.5	45.9	17	Volume of cylinder
56.5	45.9	17	Volume of cube
56.5	45.9	17	Volume of rectangular solid
56.5	45.9	17	Finding what part one number is of another
59	43.2	16	Finding what per cent one number is of another
60	41.7	15	Ratio and proportion
61	40.5	15	Finding a number when a per cent of it is known
62	35.1	13	Micrometer reading
63	33.3	12	Volume of cone
64.5	30.6	11	Volume of pyramid
64.5	30.6	11	Volume of sphere
66	22.2	8	Liquid measure

TABLE 44  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING WELDING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	85.3	29	Simple algebraic equation with one unknown
2	81.3	26	Ratio and proportion
3	80.6	29	Finding length of unknown side of right triangle
4	79.5	31	Division, fractions
5	78.1	25	Volume of cone
6	77.1	27	Reducing mixed numbers to simplest form
7	76.5	26	Acute and obtuse angles
9	77.4	24	Square root
9	77.4	24	Volume of pyramid
9	74.4	29	Multiplication, fractions
12	75.8	25	Volume of rectangular solid
12	75.8	25	Volume of cube
12	75.8	25	Volume of cylinder
14	75.7	28	Changing common fractions to decimals
15.5	75	24	Area of trapezoid
15.5	75	24	Micrometer reading
17.5	74.3	26	Circumference using $C = \pi d = 2 \pi r$
17.5	74.3	26	Area of circle using $A = \pi r^2$
19	74.2	23	Volume of sphere
20	73.5	25	Decimal equivalents
21	73	27	Improper fractions, mixed numbers
22.5	72.7	24	Meaning of percentage
22.5	72.7	24	Temperature conversion
24.5	72.2	26	Division, mixed numbers
24.5	72.2	26	Measuring angles
26	71.4	25	Division of decimals
28	71	22	Changing per cent to decimals
28	71	22	Changing decimals to per cents
28	71	22	Area of parallelogram
30	70	21	Finding per cent of a number
32	69.4	25	Using $\pi$
32	69.4	25	Changing decimals to common fractions
32	69.4	25	Multiplication, mixed numbers
34	69.2	27	Subtraction, fractions
35	68.8	22	Area of triangle
36	68.4	26	Reducing fractions to lowest terms
39.5	66.7	20	Finding what per cent one number is of another
39.5	66.7	20	Finding a number when a per cent of it is known
39.5	66.7	20	Finding what per cent one number is of another
39.5	66.7	24	Comparing fractions
39.5	66.7	20	Changing common fractions to per cents
39.5	66.7	24	Area of circle
43	63.3	19	Finding a number when a fractional part of it is known
44	62.9	22	Multiplication of decimals
45	61.5	24	Addition, fractions
46	61.3	19	Changing per cents to common fractions
47.5	61.1	22	Addition, mixed numbers
47.5	61.1	22	Subtraction, mixed numbers
49	60.6	20	Liquid measure
51	59.5	22	Reading, writing decimals
51	59.5	22	Rounding off decimals
51	59.5	22	Reading a rule
53	56.3	18	Squaring a number
54	52.9	18	Area of rectangle
56	51.4	18	Averages
56	51.4	18	Area of square
56	51.4	18	Subtraction of decimals
58	50	18	Addition of decimals
59	43.8	14	Dividing whole numbers and decimals by 10,100,etc.
60	40.5	15	Division, whole numbers
61	37.5	12	Multiplying whole numbers and decimals by 10,100,etc.
62	36.1	13	Rounding numbers
63	29.2	11	Multiplication, whole numbers
64	18.9	7	Addition, whole numbers
65	17.1	6	Reading large numbers
66	16.2	6	Subtraction, whole numbers



TABLE 45

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF WOODWORKING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
4.5	100	18	Addition, whole numbers
4.5	100	18	Subtraction, whole numbers
4.5	100	18	Multiplication, whole numbers
4.5	100	18	Division, whole numbers
4.5	100	18	Reducing fractions to lowest terms
4.5	100	18	Addition, fractions
4.5	100	18	Subtraction, fractions
4.5	100	17	Measuring angles
11	94.4	17	Division, fractions
11	94.4	17	Addition, mixed numbers
11	94.4	17	Subtraction, mixed numbers
11	94.4	17	Reading a rule
11	94.4	17	Reading, writing decimals
15	94.1	16	Area of rectangle
15	94.1	16	Area of square
15	94.1	16	Rounding off decimals
19	88.9	16	Reducing mixed numbers to simplest form
19	88.9	16	Changing decimals to common fractions
19	88.9	16	Changing common fractions to decimals
19	88.9	16	Multiplication, fractions
19	88.9	16	Division, mixed numbers
22.5	88.2	15	Area of triangle
22.5	88.2	15	Rounding numbers
25	83.3	15	Multiplication, mixed numbers
25	83.3	15	Improper fractions, mixed numbers
25	83.3	15	Acute and obtuse angles
27	82.4	14	Reading large numbers
29	76.5	13	Finding length of unknown side of right triangle
29	76.5	13	Area of circle
29	76.5	13	Comparing fractions
32	72.2	13	Decimal equivalents
32	72.2	13	Addition of decimals
32	72.2	13	Subtraction of decimals
34	70.6	12	Averages
37	66.7	12	Multiplication of decimals
37	66.7	12	Division of decimals
37	66.7	12	Square root
37	66.7	12	Circumference using $C = \pi d = 2\pi r$
37	66.7	12	Area of circle using $A = \pi r^2$
40	64.7	11	Volume of cube
41	61.6	11	Using $\pi$
42	61.1	11	Squaring a number
43	58.8	10	Volume of rectangular solid
44.5	55.6	10	Multiplying whole numbers and decimals by 10, 100, etc.
44.5	55.6	10	Dividing whole numbers and decimals by 10, 100, etc.
46.5	52.9	9	Ratio and proportion
46.5	52.9	9	Simple algebraic equation with one unknown
48	50	9	Meaning of percentage
49.5	47.1	8	Micrometer reading
49.5	47.1	8	Finding a number when a fractional part of it is known
54	44.4	8	Changing per cent to decimals
54	44.4	8	Changing decimals to per cents
54	44.4	8	Volume of cylinder
54	44.4	8	Area of trapezoid
54	44.4	8	Area of parallelogram
54	44.4	8	Finding per cent of a number
54	44.4	8	Finding what part one number is of another
59.5	38.9	7	Finding what per cent one number is of another
59.5	38.9	7	Finding a number when a per cent of it is known
59.5	38.9	7	Changing per cents to common fractions
59.5	38.9	7	Changing common fractions to per cents
63.5	22.2	4	Liquid measure
63.5	22.2	4	Volume of sphere
63.5	22.2	4	Volume of cone
63.5	22.2	4	Volume of pyramid
66	5.6	1	Temperature conversion

66

TABLE 46  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING WOODWORKING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	94.4	17	Changing decimals to common fractions
2	94.1	16	Division, fractions
4	88.9	16	Changing common fractions to decimals
4	88.9	16	Multiplication, mixed numbers
4	88.9	16	Division, mixed numbers
6.5	88.2	15	Volume of cube
6.5	88.2	15	Improper fractions, mixed numbers
8.5	87.5	14	Multiplication, fractions
8.5	87.5	14	Finding length of unknown side of right triangle
10	86.7	13	Micrometer reading
11	83.3	15	Comparing fractions
15	81.3	13	Changing per cents to common fractions
15	81.3	13	Changing common fractions to per cents
15	81.3	13	Finding per cent of a number
15	81.3	13	Finding what per cent one number is of another
15	81.3	13	Finding a number when a per cent of it is known
15	81.3	13	Finding what part one number is of another
15	81.3	13	Finding a number when a fractional part of it is known
22.5	82.4	14	Decimal equivalents
22.5	82.4	14	Using $\pi$
22.5	82.4	14	Circumference using $C = \pi d = 2\pi r$
22.5	82.4	14	Area of circle using $A = \pi r^2$
22.5	82.4	14	Volume of rectangular solid
22.5	82.4	14	Measuring angles
22.5	82.4	14	Area of triangle
22.5	82.4	14	Area of trapezoid
27	81.3	13	Square root
28.5	77.8	14	Meaning of percentage
28.5	77.8	14	Reading a rule
34.5	76.5	13	Volume of cylinder
34.5	76.5	13	Volume of sphere
34.5	76.5	13	Volume of cone
34.5	76.5	13	Volume of pyramid
34.5	76.5	13	Simple algebraic equation with one unknown
34.5	76.5	13	Acute and obtuse angles
34.5	76.5	13	Reducing fractions to lowest terms
34.5	76.5	13	Addition, fractions
34.5	76.5	13	Subtraction, fractions
34.5	76.5	13	Area of parallelogram
40.5	75	12	Squaring a number
40.5	75	12	Ratio and proportion
42.5	72.2	13	Changing per cent to decimals
42.5	72.2	13	Changing decimals to per cents
44.5	70.6	12	Dividing whole numbers and decimals by 10,100,etc.
44.5	70.6	12	Reducing mixed numbers to simplest form
46	68.8	11	Temperature conversion
47.5	66.7	12	Area of rectangle
47.5	66.7	12	Averages
50	64.7	11	Liquid measure
50	64.7	11	Area of circle
50	64.7	11	Multiplying whole numbers and decimals by 10, 100,etc.
52.5	61.1	11	Area of square
52.5	61.1	11	Subtraction, mixed numbers
54.5	58.8	10	Division of decimals
54.5	58.8	10	Rounding off decimals
57.5	55.6	10	Rounding numbers
57.5	55.6	10	Reading, writing decimals
57.5	55.6	10	Multiplication of decimals
57.5	55.6	10	Addition, mixed numbers
60.5	50	9	Addition of decimals
60.5	50	9	Subtraction of decimals
62	38.9	7	Division, whole numbers
63	33.3	6	Reading large numbers
64.5	27.8	5	Multiplication, whole numbers
64.5	27.8	5	Addition, whole numbers
66	22.2	4	Subtraction, whole numbers

TABLE 47

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF TRADE AND INDUSTRIAL OCCUPATIONS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1	98.5	Addition, whole numbers
2	97.5	Subtraction, whole numbers
3	96.3	Multiplication, whole numbers
4	95.2	Division, whole numbers
5	91.5	Reading a rule
6	88.7	Addition, fractions
7	87.5	Subtraction, fractions
8	87.2	Reading, writing decimals
9	85.1	Addition, mixed numbers
10	83.6	Subtraction, mixed numbers
11	83.4	Reducing fractions to lowest terms
12.5	81.4	Rounding off decimals
12.5	81.4	Addition of decimals
14	81.3	Multiplication, fractions
15	81.2	Rounding numbers
16.5	80.3	Division, fractions
16.5	80.3	Subtraction of decimals
18	80.2	Changing common fractions to decimals
19	78.5	Meaning of percentage
20	78.3	Multiplication, mixed numbers
21	76.7	Division, mixed numbers
22	77.3	Reducing mixed numbers of simplest form
23	76.4	Decimal equivalents
24	76.1	Multiplication of decimals
25	75.6	Averages
26	75.4	Reading large numbers
27	75	Changing decimals to common fractions
28	74.3	Division of decimals
29	73.2	Improper fractions, mixed numbers
30.5	72.6	Measuring angles
30.5	72.6	Multiplying whole numbers and decimals by 10, 100, etc.
32	71.5	Dividing whole numbers and decimals by 10, 100, etc.
33	71.2	Comparing fractions
34	69.8	Ratio and proportion
35	69.2	Finding per cent of a number
36	65.2	Changing per cent to decimals
37	64.4	Changing decimals to per cents
38	63.3	Area of square
39	61.4	Using $\pi$
40	60.4	Squaring a number
41	60.3	Area of rectangle
42	59.7	Area of circle
43	58.4	Finding what per cent one number is of another
44	58	Changing common fractions to per cents
45	57.8	Circumference using $C = \pi d = 2\pi r$
46	56.7	Finding what part one number is of another
47	56.5	Area of circle using $A = \pi r^2$
48	55.8	Micrometer reading
49	55.5	Changing per cents to common fractions
50	55.3	Finding length of unknown side of right triangle
51	54.9	Square root
52	54.6	Liquid measure
53	53.7	Finding a number when a fractional part of it is known
54	52.9	Acute and obtuse angles
55	52.4	Finding a number when a per cent of it is known
56	52.2	Simple algebraic equation with one unknown
57	48.2	Area of triangle
58	45.7	Volume of cylinder
59	43	Volume of cube
60	42.5	Area of parallelogram
61	41.2	Volume of rectangular solid
62	39.6	Temperature conversion
63	33.7	Area of trapezoid
64	28.1	Volume of sphere
65	26.8	Volume of cone
66	26.6	Volume of pyramid

TABLE 48

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF TRADE AND INDUSTRIAL SUBJECTS WHO FELT THAT  
THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	78.6	Ratio and proportion
2	78.2	Finding length of unknown side of right triangle
3	76.9	Changing common fractions to decimals
4	76.3	Square root
5	75.6	Volume of cylinder
6	75.3	Measuring angles
7.5	74.7	Acute and obtuse angles
7.5	74.7	Simple algebraic equation with one unknown
9	74.5	Finding a number when a fractional part of it is known
11.5	74.2	Volume of cone
11.5	74.2	Volume of pyramid
11.5	74.2	Circumference using $C = \pi d = 2\pi r$
11.5	74.2	Decimal equivalents
14.5	74.1	Changing decimals to common fractions
14.5	74.1	Area of circle using $A = \pi r^2$
16.5	74	Division, fractions
16.5	74	Volume of sphere
18	73.8	Area of trapezoid
19	73.6	Finding what per cent one number is of another
20	73.4	Finding what part one number is of another
21	72.8	Micrometer reading
22	72.7	Finding a number when a per cent of it is known
23	72.5	Temperature conversion
24	72.3	Improper fractions, mixed numbers
25	72	Multiplication, fractions
26	71.6	Division, mixed numbers
27	71.1	Area of circle
28	70.6	Area of triangle
29	70.5	Comparing fractions
30	70.4	Volume of cube
32	70.2	Reducing mixed numbers to simplest form
32	70.2	Reducing fractions to lowest terms
32	70.2	Using $\pi$
34	70	Changing decimals to per cents
35.5	69.5	Subtraction, fractions
35.5	69.5	Area of parallelogram
37.5	69.3	Changing per cents to common fractions
37.5	69.3	Volume of rectangular solid
39	69.1	Finding per cent of a number
40	69	Changing common fractions to per cents
41	68.9	Multiplication, mixed numbers
42	67.5	Changing per cent to decimals
43	66.9	Addition, fractions
44.5	66.6	Reading, writing decimals
44.5	66.6	Division of decimals
46	65.5	Meaning of percentage
47	65.1	Subtraction, mixed numbers
48	63.9	Addition, mixed numbers
49	62.5	Rounding off decimals
50	60.5	Multiplication of decimals
51	61.8	Reading a rule
52.5	60.3	Liquid measure
52.5	60.3	Squaring a number
54	58.6	Area of rectangle
55	57	Area of square
56.5	56.8	Averages
56.5	56.8	Dividing whole numbers and decimals by 10, 100, etc.
58	52.7	Multiplying whole numbers and decimals by 10, 100, etc.
59	50.7	Subtraction of decimals
60	49.9	Addition of decimals
61	43.8	Division, whole numbers
62	41.5	Rounding numbers
63	36.5	Multiplication, whole numbers
64	33.9	Reading large numbers
65	27	Subtraction, whole numbers
66	25.8	Addition, whole numbers

TABLE 49  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF BUILDING TECHNOLOGY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
19.5	100	14	Decimal equivalents
19.5	100	14	Addition of decimals
19.5	100	14	Subtraction of decimals
19.5	100	14	Ratio and proportion
19.5	100	14	Measuring angles
19.5	100	14	Acute and obtuse angles
19.5	100	14	Finding length of unknown side of right triangle
19.5	100	14	Using pi $\pi$
19.5	100	14	Circumference using $C = \pi d = 2\pi r$
19.5	100	14	Area of circle using $A = \pi r^2$
19.5	100	14	Area of rectangle
19.5	100	14	Area of square
19.5	100	14	Area of parallelogram
19.5	100	14	Area of triangle
19.5	100	14	Area of trapezoid
19.5	100	14	Area of circle
19.5	100	14	Volume of rectangular solid
19.5	100	14	Volume of cube
19.5	100	14	Volume of cylinder
19.5	100	14	Volume of sphere
19.5	100	14	Volume of cone
19.5	100	14	Volume of pyramid
19.5	100	14	Simple algebraic equation with one unknown
19.5	100	14	Reading large numbers
19.5	100	14	Rounding numbers
19.5	100	14	Addition, whole numbers
19.5	100	14	Subtraction, whole numbers
19.5	100	14	Multiplication, whole numbers
19.5	100	14	Division, whole numbers
19.5	100	14	Finding per cent of a number
19.5	100	14	Meaning of percentage
19.5	100	14	Squaring a number
19.5	100	14	Square root
19.5	100	14	Reading a rule
19.5	100	14	Addition, fractions
19.5	100	14	Subtraction, fractions
19.5	100	14	Multiplication, fractions
19.5	100	14	Division, fractions
48	92.9	13	Changing decimals to common fractions
48	92.9	13	Averages
48	92.9	13	Reducing fractions to lowest terms
48	92.9	13	Comparing fractions
48	92.9	13	Improper fractions, mixed numbers
48	92.9	13	Reducing mixed numbers to simplest form
48	92.9	13	Addition, mixed numbers
48	92.9	13	Subtraction, mixed numbers
48	92.9	13	Multiplication, mixed numbers
48	92.9	13	Division, mixed numbers
48	92.9	13	Reading, writing decimals
48	92.9	13	Rounding off decimals
48	92.9	13	Changing common fractions to decimals
48	92.9	13	Multiplication of decimals
48	92.9	13	Division of decimals
48	92.9	13	Finding what per cent one number is of another
48	92.9	13	Finding a number when a per cent of it is known
48	92.9	13	Finding what part one number is of another
48	92.9	13	Finding a number when a fractional part of it is known
59.5	85.7	12	Changing per cent to decimals
59.5	85.7	12	Changing decimals to per cents
59.5	85.7	12	Changing per cents to common fractions
59.5	85.7	12	Changing common fractions to per cents
62.5	78.6	11	Multiplying whole numbers and decimals by 10, 100, etc.
62.5	78.6	11	Dividing whole numbers and decimals by 10, 100, etc.
64	64.3	9	Liquid measure
65	50	7	Temperature conversion
66	35.7	5	Micrometer reading

TABLE 50  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING BUILDING TECHNOLOGY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	85.7	12	Finding a number when a per cent of it is known
2	78.6	11	Finding what per cent one number is of another
3	76.9	10	Finding length of unknown side of right triangle
4	75	9	Changing decimals to common fractions
8.5	71.4	10	Ratio and proportion
8.5	71.4	10	Volume of sphere
8.5	71.4	10	Volume of cone
8.5	71.4	10	Volume of pyramid
8.5	71.4	10	Finding what part one number is of another
8.5	71.4	10	Changing common fractions to per cents
8.5	71.4	10	Finding per cent of a number
13.5	69.2	9	Division, mixed numbers
13.5	69.2	9	Changing common fractions to decimals
16	64.3	9	Averages
16	64.3	9	Volume of cylinder
16	64.3	9	Finding a number when a fractional part of it is known
19	61.5	8	Rounding off decimals
19	61.5	8	Changing decimals to per cents
19	61.5	8	Micrometer reading
25.5	57.1	8	Division, fractions
25.5	57.1	8	Comparing fractions
25.5	57.1	8	Temperature conversion
25.5	57.1	8	Area of triangle
25.5	57.1	8	Area of trapezoid
25.5	57.1	8	Simple algebraic equation with one unknown
25.5	57.1	8	Circumference using $C = \pi d = 2\pi r$
25.5	57.1	8	Changing per cents to common fractions
25.5	57.1	8	Decimal equivalents
25.5	57.1	8	Meaning of percentage
31.5	53.8	7	Changing per cent to decimals
31.5	53.8	7	Multiplication, mixed numbers
38	50	7	Area of parallelogram
38	50	7	Multiplication, fractions
38	50	7	Reducing mixed numbers to simplest form
38	50	7	Reducing fractions to lowest terms
38	50	7	Volume of cube
38	50	7	Using $\pi$
38	50	7	Area of circle using $A = \pi r^2$
38	50	7	Measuring angles
38	50	7	Acute and obtuse angles
38	50	7	Liquid measure
38	50	7	Area of circle
44	46.2	6	Reading, writing decimals
46.5	42.9	6	Volume of rectangular solid
46.5	42.9	6	Improper fractions, mixed numbers
46.5	42.9	6	Subtraction of decimals
46.5	42.9	6	Addition, fractions
50	38.5	5	Addition, mixed numbers
50	38.5	5	Subtraction, mixed numbers
50	38.5	5	Division of decimals
53.5	35.7	5	Squaring a number
53.5	35.7	5	Addition of decimals
53.5	35.7	5	Subtraction, fractions
53.5	35.7	5	Rounding numbers
56	30.8	4	Multiplication of decimals
58.5	28.6	4	Area of rectangle
58.5	28.6	4	Area of square
58.5	28.6	4	Reading a rule
58.5	28.6	4	Reading large numbers
61.5	25	3	Multiplying whole numbers and decimals by 10,100,etc.
61.5	25	3	Dividing whole numbers and decimals by 10,100,etc.
63	21.4	3	Subtraction, whole numbers
65	14.3	2	Multiplication, whole numbers
65	14.3	2	Division, whole numbers
65	14.3	2	Addition, whole numbers

TABLE 51  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CHEMICAL TECHNOLOGY TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
11	100	12	Addition of decimals
11	100	12	Subtraction of decimals
11	100	12	Multiplication of decimals
11	100	12	Division of decimals
11	100	12	Multiplying whole numbers and decimals by 10, 100, etc.
11	100	12	Dividing whole numbers and decimals by 10, 100, etc.
11	100	12	Meaning of percentage
11	100	12	Changing per cent to decimals
11	100	12	Changing decimals to per cents
11	100	12	Liquid measure
11	100	12	Temperature conversion
11	100	12	Ratio and proportion
11	100	12	Addition, whole numbers
11	100	12	Subtraction, whole numbers
11	100	12	Multiplication, whole numbers
11	100	12	Division, whole numbers
11	100	12	Reading, writing decimals
11	100	12	Rounding off decimals
11	100	12	Finding what part one number is of another
11	100	11	Simple algebraic equation with one unknown
11	100	12	Finding per cent of a number
24.5	91.7	11	Changing common fractions to decimals
24.5	91.7	11	Reading large numbers
24.5	91.7	11	Rounding numbers
24.5	91.7	11	Finding what per cent one number is of another
24.5	91.7	11	Finding a number when a per cent of it is known
24.5	91.7	11	Reading a rule
28	90	9	Finding a number when a fractional part of it is known
32	83.3	10	Averages
32	83.3	10	Reducing fractions to lowest terms
32	83.3	10	Division, fractions
32	83.3	10	Comparing fractions
32	83.3	10	Changing common fractions to per cents
32	83.3	10	Squaring a number
32	83.3	10	Volume of cylinder
42	75	9	Improper fractions, mixed numbers
42	75	9	Reducing mixed numbers to simplest form
42	75	9	Addition, mixed numbers
42	75	9	Subtraction, mixed numbers
42	75	9	Multiplication, mixed numbers
42	75	9	Division, mixed numbers
42	75	9	Addition, fractions
42	75	9	Subtraction, fractions
42	75	9	Multiplication, fractions
42	75	9	Changing decimals to common fractions
42	75	9	Decimal equivalents
42	75	9	Square root
42	75	9	Changing per cents to common fractions
49	66.7	8	Using $\pi$
51	58.3	7	Area of circle using $A = \pi r^2$
51	58.3	7	Volume of rectangular solid
51	58.3	7	Volume of cube
54	50	6	Area of circle
54	50	6	Micrometer reading
54	50	6	Area of square
57	41.7	5	Circumference using $C = \pi d = 2\pi r$
57	41.7	5	Area of rectangular
57	41.7	5	Area of triangle
59	33.3	4	Volume of sphere
63	16.7	2	Measuring angles
63	16.7	2	Acute and obtuse angles
63	16.7	2	Finding length of unknown side of right triangle
63	16.7	2	Volume of cone
63	16.7	2	Volume of pyramid
63	16.7	2	Area of trapezoid
63	16.7	2	Area of parallelogram

TABLE 52

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING CHEMICAL TECHNOLOGY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	90	9	Decimal equivalents
3	83.3	10	Simple algebraic equation with one unknown
3	83.3	10	Temperature conversion
3	83.3	10	Ratio and proportion
5	81.8	9	Finding a number when a fractional part of it is known
6.5	80	8	Volume of cylinder
6.5	80	8	Changing decimals to common fractions
10	75	9	Finding per cent of a number
10	75	9	Meaning of percentage
10	75	9	Changing per cent to decimals
10	75	9	Finding a number when a per cent of it is known
10	75	9	Finding what part one number is of another
14.5	72.7	8	Changing per cents to common fractions
14.5	72.7	8	Division, mixed numbers
14.5	72.7	8	Reducing mixed numbers to simplest form
14.5	72.7	8	Square root
19	66.7	8	Liquid measure
19	66.7	8	Finding what per cent one number is of another
19	66.7	8	Dividing whole numbers and decimals by 10,100,etc.
19	66.7	8	Changing common fractions to decimals
19	66.7	8	Changing decimals to per cents
22.5	63.6	7	Comparing fractions
22.5	63.6	7	Micrometer reading
24.5	60	6	Volume of rectangular solid
24.5	60	6	Volume of cube
26.5	58.3	7	Multiplying whole numbers and decimals by 10,100,etc.
26.5	58.3	7	Changing common fractions to per cents
28	57.1	4	Area of triangle
31.5	54.5	6	Addition, mixed numbers
31.5	54.5	6	Subtraction, mixed numbers
31.5	54.5	6	Multiplication, mixed numbers
31.5	54.5	6	Division of decimals
31.5	54.5	6	Reducing fractions to lowest terms
31.5	54.5	6	Improper fractions, mixed numbers
35.5	50	6	Reading, writing decimals
35.5	50	6	Rounding off decimals
38	45.5	5	Multiplication of decimals
38	45.5	5	Division, fractions
38	45.5	5	Reading a rule
40	42.9	3	Area of parallelogram
42.5	37.5	3	Measuring angles
42.5	37.5	3	Area of circle
42.5	37.5	3	Volume of sphere
42.5	37.5	3	Area of square
46	36.4	4	Addition, fractions
46	36.4	4	Subtraction, fractions
46	36.4	4	Multiplication, fractions
50	33.3	2	Area of trapezoid
50	33.3	2	Finding length of unknown side of right triangle
50	33.3	3	Using $\pi$
50	33.3	4	Averages
50	33.3	4	Rounding numbers
54	28.6	2	Acute and obtuse angles
54	28.6	2	Volume of cone
54	28.6	2	Volume of pyramid
56.5	27.3	3	Squaring a number
56.5	27.3	3	Reading large numbers
58	25	2	Circumference using $C = \pi d = 2\pi r$
59.5	22.2	2	Area of circle using $A = \pi r^2$
59.5	22.2	2	Area of rectangle
61	18.2	2	Multiplication, whole numbers
62	16.7	2	Division, whole numbers
63.5	8.3	1	Addition, whole numbers
63.5	8.3	1	Subtraction, whole numbers
65.5	0	0	Addition of decimals
65.5	0	0	Subtraction of decimals



TABLE 53  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DRAFTING DESIGN TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
10.5	100	34	Division, mixed numbers
10.5	100	34	Reading a rule
10.5	100	34	Area of circle
10.5	100	34	Measuring angles
10.5	100	34	Acute and obtuse angles
10.5	100	34	Using pi $\pi$
10.5	100	34	Circumference using $C = \pi d = 2 \pi r$
10.5	100	34	Area of circle using $A = \pi r^2$
10.5	100	34	Area of rectangle
10.5	100	34	Area of square
10.5	100	34	Addition, fractions
10.5	100	34	Subtraction, fractions
10.5	100	34	Multiplication, fractions
10.5	100	34	Division, fractions
10.5	100	34	Addition, whole numbers
10.5	100	34	Subtraction, whole numbers
10.5	100	34	Multiplication, whole numbers
10.5	100	34	Addition, mixed numbers
10.5	100	34	Subtraction, mixed numbers
10.5	100	34	Changing decimals to common fractions
26.5	97.1	33	Finding length of unknown side or right triangle
26.5	97.1	33	Simple algebraic equation with one unknown
26.5	97.1	33	Area of triangle
26.5	97.1	33	Improper fractions, mixed numbers
26.5	97.1	33	Decimal equivalents
26.5	97.1	33	Addition of decimals
26.5	97.1	33	Subtraction of decimals
26.5	97.1	33	Reducing fractions to lowest terms
26.5	97.1	33	Multiplication, mixed numbers
26.5	97.1	33	Reading, writing decimals
26.5	97.1	33	Division, whole numbers
26.5	97.1	33	Rounding numbers
38.5	94.1	32	Micrometer reading
38.5	94.1	32	Rounding off decimals
38.5	94.1	32	Changing common fractions to decimals
38.5	94.1	32	Volume of rectangular solid
38.5	94.1	32	Volume of cube
38.5	94.1	32	Volume of cylinder
38.5	94.1	32	Comparing fractions
38.5	94.1	32	Multiplication of decimals
38.5	94.1	32	Division of decimals
38.5	94.1	32	Squaring a number
38.5	94.1	32	Square root
38.5	99.1	32	Reducing mixed numbers to simplest form
45	91.2	31	Ratio and proportion
46	90.9	30	Area of trapezoid
48	88.2	30	Reading large numbers
48	88.2	30	Area of parallelogram
48	88.2	30	Dividing whole numbers and decimals by 10, 100, etc.
50	87.9	29	Multiplying whole numbers and decimals by 10, 100, etc.
53	85.3	29	Averages
53	85.3	29	Meaning of percentage
53	85.3	29	Volume of sphere
53	85.3	29	Volume of cone
53	85.3	29	Volume of pyramid
56	82.4	28	Finding what part one number is of another
57	79.4	27	Finding a number when a fractional part of it is known
58	76.5	26	Finding what per cent one numbers is of another
59	75.8	25	Changing decimals to per cents
61	73.5	25	Finding per cent of a number
61	73.5	25	Changing per cent to decimals
61	73.5	25	Changing per cents to common fractions
63.5	70.6	24	Changing common fractions to per cents
63.5	70.6	24	Finding a number when a per cent of it is known
65	67.6	23	Liquid measure
66	58.8	20	Temperature conversion

TABLE 54  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DRAFTING DESIGN STUDENT

RANK	PERCENT	NUMBER	SKILL
1	79.4	27	Area of circle using $A = \pi r^2$
3	76.5	26	Volume of cone
3	76.5	26	Volume of pyramid
3	76.5	26	Finding length of unknown side of right triangle
5	75.8	25	Temperature conversion
8	73.5	25	Circumference using $C = \pi d = 2\pi r$
8	73.5	25	Micrometer reading
8	73.5	25	Volume of cylinder
8	73.5	25	Volume of sphere
8	73.5	25	Area of circle
11	71.9	23	Changing decimals to per cents
13	70.6	24	Area of parallelogram
13	70.6	24	Area of triangle
13	70.6	24	Area of trapezoid
17.5	69.7	23	Square root
17.5	69.7	23	Finding a number when a fractional part of it is known
17.5	69.7	23	Changing per cent to decimals
17.5	69.7	23	Changing decimals to common fractions
17.5	69.7	23	Changing per cents to common fractions
17.5	69.7	23	Changing common fractions to per cents
22	67.6	23	Volume of rectangular solid
22	67.6	23	Volume of cube
22	67.6	23	Changing common fractions to decimals
24.5	66.7	22	Finding a number when a per cent of it is known
24.5	66.7	22	Finding what part one number is of another
26.5	64.7	22	Reducing mixed numbers to simplest form
26.5	64.7	22	Division, mixed numbers
28.5	62.5	20	Decimal equivalents
28.5	62.5	20	Liquid measure
32.5	61.8	21	Ratio and proportion
32.5	61.8	21	Using $\pi$
32.5	61.8	21	Simple algebraic equation with one unknown
32.5	61.8	21	Improper fractions, mixed numbers
32.5	61.8	21	Addition, mixed numbers
32.5	61.8	21	Subtraction, mixed numbers
36	59.4	19	Finding what per cent one number is of another
39.5	58.8	20	Multiplication, mixed numbers
39.5	58.8	20	Multiplication, fractions
39.5	58.8	20	Division, fractions
39.5	58.8	20	Comparing fractions
39.5	58.8	20	Area of rectangle
39.5	58.8	20	Area of square
43	57.6	19	Acute and obtuse angles
44	56.3	18	Finding per cent of a number
45	55.9	19	Measuring angles
46.5	54.5	18	Reducing fractions to lowest terms
46.5	54.5	18	Division of decimals
48	51.5	17	Subtraction, fractions
49.5	50	17	Reading, writing decimals
49.5	50	17	Rounding off decimals
51	48.5	16	Addition, fractions
52	47.1	26	Reading a rule
53.5	45.5	15	Meaning of percentage
53.5	45.5	15	Multiplication of decimals
55	41.2	14	Squaring a number
56.5	39.4	13	Subtraction of decimals
56.5	39.4	13	Averages
58	36.4	12	Addition of decimals
59	34.4	11	Multiplying whole numbers and decimals by 10,100,etc.
60	33.3	11	Dividing whole numbers and decimals by 10,100,etc.
61.5	26.5	9	Division, whole numbers
61.5	26.5	9	Rounding numbers
63	23.5	8	Multiplication, whole numbers
64	15.2	5	Reading large numbers
65	11.8	4	Subtraction, whole numbers
66	8.8	3	Addition, whole numbers

TABLE 55  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF ELECTRONICS TECHNOLOGY TEACHERS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
8.5	100	32	Addition, whole numbers
8.5	100	32	Subtraction, whole numbers
8.5	100	32	Multiplication, whole numbers
8.5	100	32	Division, whole numbers
8.5	100	32	Addition of decimals
8.5	100	32	Subtraction of decimals
8.5	100	32	Multiplication of decimals
8.5	100	32	Division of decimals
8.5	100	32	Multiplying whole numbers and decimals by 10,100,etc.
8.5	100	32	Dividing whole numbers and decimals by 10,100,etc.
8.5	100	32	Meaning of percentage
8.5	100	32	Squaring a number
8.5	100	32	Square root
8.5	100	32	Using pi $\pi$
8.5	100	32	Reading, writing decimals
8.5	100	32	Rounding off decimals
18	96.9	31	Changing common fractions to decimals
18	96.9	31	Ratio and proportion
18	96.9	31	Reading large numbers
20.5	96.8	30	Rounding numbers
20.5	96.8	30	Changing decimals to per cents
23.5	93.8	30	Averages
23.5	93.8	30	Decimal equivalents
23.5	93.8	30	Finding length of unknown side of right triangle
23.5	93.8	30	Simple algebraic equation with one unknown
26.5	93.5	29	Finding per cent of a number
26.5	93.5	29	Changing per cent to decimals
28	90.6	29	Reading a rule
29	90.3	28	Measuring angles
30	87.5	28	Finding what part one number is of another
31	86.7	26	Acute and obtuse angles
32.5	83.9	26	Finding what per cent one number is of another
32.5	83.9	26	Finding a number when a per cent of it is known
36	84.4	27	Reducing fractions to lowest terms
36	84.4	27	Addition, fractions
36	84.4	27	Subtraction, fractions
36	84.4	27	Multiplication, fractions
36	84.4	27	Division, fractions
41	81.3	26	Improper fraction, mixed numbers
41	81.3	26	Addition, mixed numbers
41	81.3	26	Subtraction, mixed numbers
41	81.3	26	Multiplication, mixed numbers
41	81.3	26	Division, mixed numbers
44.5	78.1	25	Changing decimals to common fractions
44.5	78.1	25	Reducing mixed numbers to simplest form
47	77.4	24	Changing per cents to common fractions
47	77.4	24	Changing common fractions to per cents
47	77.4	24	Finding a number when a fractional part of it is known
49	75	24	Comparing fractions
50	67.7	21	Circumference using $C=\pi d=2\pi r$
51.5	61.3	19	Temperature conversion
51.5	61.3	19	Area of circle using $A=\pi r^2$
53.5	50	15	Area of circle
53.5	50	16	Micrometer reading
55	51.6	16	Area of rectangle
56.5	48.4	15	Area of square
56.5	48.4	15	Area of triangle
58	45.2	14	Area of trapezoid
59	40	12	Area of parallelogram
60.5	26.7	8	Volume of rectangular solid
60.5	26.7	8	Volume of cube
62	20	6	Volume of cylinder
64	16.7	5	Liquid measure
64	16.7	5	Volume of pyramid
64	16.7	5	Volume of sphere
66	13.3	4	Volume of cone

TABLE 56  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING ELECTRONICS TECHNOLOGY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	83.9	26	Square root
2	81.3	26	Ratio and proportion
3	80.8	21	Area of triangle
4	80	20	Area of trapezoid
5	77.4	24	Finding length of unknown side of right triangle
6.5	72.7	16	Volume of cone
6.5	72.7	16	Volume of pyramid
8	70.8	17	Area of circle
9	68.2	15	Volume of sphere
10.5	66.7	18	Temperature conversion
10.5	66.7	16	Area of parallelogram
12	65.2	15	Volume of cylinder
13	64.3	18	Changing common fractions to per cents
15	63.3	19	Division, fractions
15	63.3	19	Comparing fractions
15	63.3	19	Measuring angles
17	63	17	Finding a number when a fractional part of it is known
18.5	62.1	18	Finding what per cent one number is of another
18.5	62.1	18	Micrometer reading
20	60.7	17	Changing per cents to common fractions
21	60	18	Dividing whole numbers and decimals by 10,100,etc.
22	59.4	19	Changing common fractions to decimals
23.5	58.6	17	Changing decimals to common fractions
23.5	58.6	17	Acute and obtuse angles
25	58.1	18	Division of decimals
26.5	56.7	17	Reducing mixed numbers to simplest form
26.5	56.7	17	Finding what part one number is of another
28	56.5	13	Volume of cube
29	55.2	16	Finding a number when a per cent of it is known
30.5	53.3	16	Meaning of percentage
30.5	53.3	16	Multiplication, fractions
30.5	53.3	16	Division, mixed numbers
30.5	53.3	16	Finding per cent of a number
34	52.2	12	Volume of rectangular solid
35	51.6	16	Reducing fractions to lowest terms
39	50	15	Decimal equivalents
39	50	15	Addition, fractions
39	50	15	Changing decimals to per cents
39	50	15	Improper fractions, mixed numbers
39	50	16	Simple algebraic equation with one unknown
39	50	16	Rounding off decimals
39	50	15	Multiplication, mixed numbers
43	48.1	13	Circumference using $C = \pi d = 2\pi r$
44	48	12	Area of circle using $A = \pi r^2$
45.5	46.7	14	Changing per cent to decimals
45.5	46.7	14	Subtraction, fractions
47	46.2	12	Area of rectangle
48	45.2	14	Using pi $\pi$
49	42.3	11	Area of square
50	45.2	14	Multiplication of decimals
51	43.8	14	Reading, writing decimals
52.2	43.3	13	Addition, mixed numbers
52.2	43.3	13	Subtraction, mixed numbers
54.5	41.9	13	Rounding numbers
54.5	41.9	13	Multiplying whole numbers and decimals by 10,100,etc.
56	38.1	8	Liquid measure
57	29	9	Reading a rule
58	22.6	7	Averages
59.5	19.4	6	Addition of decimals
59.5	19.4	6	Squaring a number
61	16.4	5	Subtraction of decimals
62.5	15.6	5	Division, whole numbers
62.5	15.6	5	Reading large numbers
64	9.4	3	Multiplication, whole numbers
65	6.3	2	Addition, whole numbers
66	3.1	1	Subtraction, whole numbers

TABLE 57  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TECHNICAL OTHER TEACHERS WHO FELT THAT THE  
SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	98.3	58	Subtraction, whole numbers
1.5	98.3	58	Addition, whole numbers
3.5	96.6	57	Division, whole numbers
3.5	96.6	57	Multiplication, whole numbers
5	94.9	56	Reading, writing decimals
6	94.8	55	Rounding off decimals
7	93.1	54	Reading a rule
8	93	53	Changing common fractions to decimals
10.5	91.5	54	Addition of decimals
10.5	91.5	54	Subtraction of decimals
10.5	91.5	54	Subtraction, fractions
10.5	91.5	54	Addition, fractions
14.5	89.8	53	Multiplication, fractions
14.5	89.8	53	Reducing fractions to lowest terms
14.5	89.8	53	Multiplication of decimals
14.5	89.8	53	Division, fractions
17	89.7	52	Rounding numbers
18	88.1	52	Decimal equivalents
19	87.9	51	Division of decimals
20	87.7	50	Dividing whole numbers and decimals by 10,100,etc.
21	86.4	51	Averages
22	86.2	50	Multiplying whole numbers and decimals by 10,100,etc.,
23	86.1	50	Finding per cent of a number
24.5	86	49	Subtraction, mixed numbers
24.5	86	49	Addition, mixed numbers
26	84.7	50	Reading large numbers
28.5	84.5	49	Meaning of percentage
28.5	84.5	49	Reducing mixed numbers to simplest form
28.5	84.5	49	Comparing fractions
28.5	84.5	49	Ratio and proportion
31.5	84.2	48	Division, mixed numbers
31.5	84.2	48	Multiplication, mixed numbers
33	83.1	49	Changing decimals to common fractions
34.5	82.8	48	Changing per cent to decimals
34.5	82.8	48	Changing decimals to per cents
36	82.5	47	Simple algebraic equation with one unknown
37	81	47	Finding what per cent one number is of another
38.5	79.3	46	Improper fractions, mixed numbers
38.5	79.3	46	Using pi $\pi$
40	78	46	Measuring angles
41	77.6	45	Changing common fractions to per cents
42	75.9	44	Changing per cents to common fractions
44	74.6	44	Area of square
44	74.6	44	Area of circle using $A = \pi r^2$
44	74.6	44	Area of rectangle
46.5	74.1	43	Circumference using $C = \pi d = 2 \pi r$
46.5	74.1	43	Finding a number when a per cent of it is known
48	73.2	41	Finding a number when a fractional part of it is known
49	72.9	43	Area of circle
50.5	71.4	40	Squaring a number
50.5	71.4	40	Finding what part one number is of another
52.5	66.7	38	Liquid measure
52.5	66.7	38	Temperature conversion
54.5	64.9	37	Micrometer reading
54.5	64.9	37	Acute and obtuse angles
56.5	62.5	35	Volume of cylinder
56.5	62.5	35	Square root
58	61.4	35	Finding length of unknown side of right triangle
59	58.2	32	Volume of cube
60	56.4	31	Volume of rectangular solid
61	55.2	32	Area of parallelogram
62.5	52.6	30	Area of trapezoid
62.5	52.6	30	Area of triangle
64	45.5	25	Volume of sphere
65	43.6	24	Volume of cone
66	40	22	Volume of pyramid

TABLE 58  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING TECHNICAL OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	90.4	47	Square root
2	83.7	41	Temperature conversion
3	82.7	43	Ratio and proportion
4	82	41	Finding a number when a fractional part of it is known
5	81.5	44	Finding what per cent one number is of another
6	80.8	42	Area of circle using $A = \pi r^2$
7	80.4	41	Micrometer reading
8.5	79.2	42	Finding a number when a per cent of it is known
8.5	79.2	42	Simple algebraic equation with one unknown
10	78.4	40	Finding what part one number is of another
11.5	77.8	42	Changing decimals to per cents
11.5	77.8	35	Volume of sphere
13	76.9	40	Changing per cents to common fractions
14	76.6	36	Volume of cylinder
15	76	38	Circumference using $C = \pi d = 2\pi r$
16	75.9	41	Changing per cent to decimals
17	75.6	34	Volume of pyramid
18	75	36	Area of trapezoid
19	74.5	41	Changing common fractions to decimals
20	73.6	39	Changing common fractions to per cents
21	73.3	33	Volume of cone
22	72.7	40	Finding per cent of a number
23.5	72.5	37	Finding length of unknown side of right triangle
23.5	72.5	37	Area of circle
25	72.2	39	Changing decimals to common fractions
26	71.4	35	Acute and obtuse angles
27	70.9	39	Decimal equivalents
28	70	35	Area of parallelogram
29	68.1	32	Volume of cube
30	67.3	35	Using $\pi$
31.5	66	35	Measuring angles
31.5	66	31	Volume of rectangular solid
33	64.9	37	Division, fractions
34	64.6	31	Area of triangle
35	63.6	35	Comparing fractions
36.5	62.5	35	Reducing mixed numbers to simplest form
36.5	62.5	35	Reading, writing decimals
38	62.3	33	Meaning of percentage
39	61.8	34	Improper fractions, mixed numbers
40	61.5	32	Squaring a number
41.5	61.4	35	Multiplication, fractions
41.5	61.4	35	Reducing fractions to lowest terms
43	59.3	32	Division of decimals
44	58	29	Liquid measure
45	55.6	30	Division, mixed numbers
46	52.7	29	Multiplication, mixed numbers
47	52.6	30	Subtraction, fractions
48	50.9	29	Addition, fractions
49	50	28	Rounding off decimals
50	48.1	25	Area of rectangle
51	47.3	26	Multiplication of decimals
52	45.3	24	Reading a rule
53	43.6	24	Subtraction, mixed numbers
54	43.4	23	Area of square
55	41.8	23	Addition, mixed numbers
56.5	37.9	20	Multiplying whole numbers and decimals by 10,100,etc.
56.5	37.9	20	Dividing whole numbers and decimals by 10,100,etc.
58	35.7	20	Averages
59.5	27.3	15	Addition of decimals
59.5	27.3	15	Subtraction of decimals
61	26.3	15	Division, whole numbers
62	21.4	12	Rounding numbers
63	21.1	12	Multiplication, whole numbers
64	17.5	10	Reading large numbers
65.5	12.1	7	Addition, whole numbers
65.5	12.1	7	Subtraction, whole numbers

33

TABLE 59

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF TECHNICAL OCCUPATIONS WHO FELT THAT THE  
SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1.5	99.5	Addition, whole numbers
1.5	99.5	Subtraction, whole numbers
3	98.4	Multiplication, whole numbers
4	97.8	Division, whole numbers
5	97.3	Reading, writing decimals
6.5	96.2	Addition of decimals
6.5	96.2	Subtraction of decimals
8	94.5	Multiplication of decimals
9	93.9	Division of decimals
10	93.4	Rounding numbers
11	92.9	Changing common fractions to decimals
12	92.6	Rounding off decimals
13.5	91.2	Meaning of percentage
13.5	91.2	Decimal equivalents
15	91.1	Dividing whole numbers and decimals by 10, 100, etc.
16	90.6	Multiplying whole numbers and decimals by 10, 100, etc.
17	90.2	Reading large numbers
19.5	89.1	Addition, fractions
19.5	89.1	Subtraction, fractions
19.5	89.1	Division, fractions
19.5	89.1	Averages
22	88.6	Multiplication, fractions
23	88.3	Finding per cent of a number
24	87.5	Reducing fractions to lowest terms
25	87.4	Addition, mixed numbers
26	87.3	Simple algebraic equation with one unknown
27	87.2	Changing decimals to per cents
28	86.8	Subtraction, mixed numbers
29	86.3	Division, mixed numbers
30	86.2	Reading a rule
31	86.1	Changing per cent to decimals
32.5	85.7	Changing decimals to common fractions
32.5	85.7	Multiplication, mixed numbers
34	85.5	Squaring a number
35	84.7	Ratio and proportion
36	83.6	Comparing fractions
37	82.8	Finding what per cent one number is of another
38	82.5	Reducing mixed numbers to simplest form
39	81.6	Finding what part one number is of another
40.5	81.4	Using pi $\pi$
40.5	81.4	Improper fractions, mixed numbers
42	80.4	Square root
43	79.4	Finding a number when a per cent of it is known
44	78.9	Finding a number when a fractional part of it is known
45	78.3	Changing common fractions to per cents
46	76.7	Changing per cents to common fractions
47	74.7	Measuring angles
48	72.1	Area of circle using $A = \pi r^2$
49	72	Circumference using $C = \pi d = 2\pi r$
50.5	68.9	Area of rectangle
50.5	69.9	Area of square
52	69.2	Area of circle
53	68.7	Finding length of unknown side of right triangle
54	67.8	Acute and obtuse angles
55	60.8	Area of triangle
56	59.8	Volume of cylinder
57	58.4	Volume of cube
58	58	Volume of rectangular solid
59	56.4	Temperature conversion
60	55.6	Area of trapezoid
61	55.2	Area of parallelogram
62	54.4	Micrometer reading
63	53.3	Liquid measure
64	48.3	Volume of sphere
65	45.9	Volume of cone
66	44.4	Volume of pyramid

TABLE 60  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF TECHNICAL OCCUPATIONS WHO FELT THAT THE  
SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	75.9	Square root
2	72.7	Ratio and proportion
3	71	Temperature conversion
4	70.8	Micrometer reading
5	70.1	Finding a number when a fractional part of it is known
6	69.4	Volume of cylinder
7	69.3	Volume of pyramid
8.5	68.4	Area of trapezoid
8.5	68.4	Volume of sphere
10	68.3	Finding length of unknown side of right triangle
11	68.2	Finding a number when a per cent of it is known
12	68	Volume of cone
13	67.8	Finding what per cent one number is of another
14	66.3	Finding what part one number is of another
15	66.1	Changing per cents to common fractions
16	65.9	Changing common fractions to per cents
17	65.5	Changing decimals to per cents
18	65.3	Simple algebraic equation with one unknown
19	64.6	Area of triangle
20	64.3	Changing decimals to common fractions
21	64.2	Changing common fractions to decimals
22	63.7	Area of parallelogram
23	63.2	Area of circle using $A = \pi r^2$
24	62.8	Changing per cent to decimals
25	62.5	Area of circle
26	61.1	Circumference using $C = \pi d = 2 \pi r$
27	60.5	Volume of cube
28	60.1	Finding per cent of a number
29	58.8	Decimal equivalents
30	58.2	Multiplication, fractions
31.5	57.7	Comparing fractions
31.5	57.7	Volume of rectangular solid
33	57.3	Division, fractions
34	57.1	Acute and obtuse angles
35	56.9	Measuring angles
36	56.4	Division, mixed numbers
37	56.3	Reducing mixed numbers to simplest form
38	54.4	Using pi $\pi$
39	53.8	Improper fractions, mixed numbers
40	53.5	Meaning of percentage
41.5	52.2	Liquid measure
41.5	52.2	Reducing fractions to lowest terms
43	51.7	Division of decimals
44	51.2	Multiplication, mixed numbers
45	48.3	Reading, writing decimals
46	46.2	Subtraction, mixed numbers
47	46.1	Rounding off decimals
48	45.8	Subtraction, fractions
49	45.7	Addition, mixed numbers
50	45.5	Addition, fractions
51	43.3	Area of rectangle
52	42.7	Area of square
53	42.2	Multiplication of decimals
54	40.9	Squaring a number
55	38.6	Reading a rule
56	37.1	Dividing whole numbers and decimals by 10, 100, etc.
57	36.3	Averages
58	33.5	Multiplying whole numbers and decimals by 10, 100, etc.
59	27.2	Rounding numbers
60	25.3	Subtraction of decimals
61	24.7	Addition of decimals
62	19.8	Division, whole numbers
63	17.2	Reading large numbers
64	16	Multiplication, whole numbers
65	9.8	Subtraction, whole numbers
66	9.3	Addition, whole numbers



TABLE 61

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DENTAL OCCUPATION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
3	100	9	Liquid measure
3	100	9	Addition, whole numbers
3	100	9	Subtraction, whole numbers
3	100	9	Multiplication, whole numbers
3	100	9	Division, whole numbers
7	75	6	Reading, writing decimals
7	75	6	Rounding off decimals
7	75	6	Meaning of percentage
10.5	62.5	5	Temperature conversion
10.5	62.5	5	Multiplication of decimals
10.5	62.5	5	Addition of decimals
10.5	62.5	5	Multiplication, fractions
17	50	4	Division, fractions
17	50	4	Changing per cent to decimals
17	50	4	Changing decimals to per cents
17	50	4	Subtraction of decimals
17	50	4	Changing common fractions to decimals
17	50	4	Division of decimals
17	50	4	Ratio and proportion
17	50	4	Finding per cent of a number
17	50	4	Averages
29.5	37.5	3	Multiplying whole numbers and decimals by 10, 100, etc.
29.5	37.5	3	Dividing whole numbers and decimals by 10, 100, etc.
29.5	37.5	3	Decimal equivalents
29.5	37.5	3	Comparing fractions
29.5	37.5	3	Improper fractions, mixed numbers
29.5	37.5	3	Reducing mixed numbers to simplest form
29.5	37.5	3	Addition, mixed numbers
29.5	37.5	3	Subtraction, mixed numbers
29.5	37.5	3	Multiplication, mixed numbers
29.5	37.5	3	Division, mixed numbers
29.5	37.5	3	Addition, fractions
29.5	37.5	3	Subtraction, fractions
29.5	37.5	3	Changing common fractions to per cents
29.5	37.5	3	Reading large numbers
29.5	37.5	3	Rounding numbers
29.5	37.5	3	Reading a rule
38.5	33.3	3	Measuring angles
38.5	33.3	3	Acute and obtuse
41.5	25	2	Reducing fractions to lowest terms
41.5	25	2	Changing decimals to common fractions
41.5	25	2	Micrometer reading
41.5	25	2	Volume of cylinder
51.5	12.5	1	Area of square
51.5	12.5	1	Area of parallelogram
51.5	12.5	1	Area of triangle
51.5	12.5	1	Area of trapezoid
51.5	12.5	1	Area of circle
51.5	12.5	1	Volume of rectangular solid
51.5	12.5	1	Volume of cube
51.5	12.5	1	Volume of sphere
51.5	12.5	1	Volume of cone
51.5	12.5	1	Volume of pyramid
51.5	12.5	1	Simple algebraic equation with one unknown
51.5	12.5	1	Finding what per cent one number is of another
51.5	12.5	1	Finding a number when a per cent of it is known
51.5	12.5	1	Finding what part one number is of another
51.5	12.5	1	Finding a number when a fractional part of it is known
51.5	12.5	1	Changing per cents to common fractions
63	0	0	Finding length of unknown side of right triangle
63	0	0	Using $\pi$
63	0	0	Circumference using $C = \pi d = 2\pi r$
63	0	0	Area of circle using $A = \pi r^2$
63	0	0	Area of rectangle
63	0	0	Squaring a number
63	0	0	Square root

TABLE 62

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DENTAL OCCUPATION STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	71.4	5	Meaning of percentage
1.5	71.4	5	Averages
6	66.7	4	Reducing fractions to lowest terms
6	66.7	4	Addition, fractions
6	66.7	4	Subtraction, fractions
6	66.7	4	Multiplication, fractions
6	66.7	4	Comparing fractions
6	66.7	4	Improper fractions, mixed numbers
6	66.7	6	Liquid measure
12	57.1	4	Decimal equivalents
12	57.1	4	Temperature conversion
12	57.1	4	Ratio and proportion
12	57.1	4	Reading, writing decimals
12	57.1	4	Rounding off decimals
28	50	3	Volume of sphere
28	50	3	Volume of cone
28	50	3	Volume of pyramid
28	50	3	Reducing mixed numbers to simplest form
28	50	3	Addition, mixed numbers
28	50	3	Subtraction, mixed numbers
28	50	3	Multiplication, mixed numbers
28	50	3	Division, mixed numbers
28	50	3	Micrometer reading
28	50	3	Division, fractions
28	50	3	Changing per cent to decimals
28	50	3	Changing decimals to per cents
28	50	3	Changing decimals to common fractions
28	50	3	Finding a number when a per cent of it is known
28	50	3	Finding what part one number is of another
28	50	3	Finding a number when a fractional part of it is known
28	50	3	Area of square
28	50	3	Area of parallelogram
28	50	3	Area of triangle
28	50	3	Area of trapezoid
28	50	3	Area of circle
28	50	3	Volume of rectangular solid
28	50	3	Volume of cube
28	50	3	Changing common fractions to decimals
28	50	3	Changing common fractions to per cents
28	50	4	Measuring angles
28	50	4	Acute and obtuse angles
44	42.9	3	Multiplying whole numbers and decimals by 10,100,etc
44	42.9	3	Dividing whole numbers and decimals by 10,100,etc.
44	42.9	3	Reading a rule
44	42.9	3	Finding per cent of a number
44	42.9	3	Volume of cylinder
53.5	33.3	2	Changing per cents to common fractions
53.5	33.3	2	Simple algebraic equation with one unknown
53.5	33.3	2	Finding what per cent one number is of another
53.5	33.3	2	Squaring a number
53.5	33.3	2	Square root
53.5	33.3	2	Finding length of unknown side of right triangle
53.5	33.3	2	Using $\pi$
53.5	33.3	2	Circumference using $C = \pi d = 2\pi r$
53.5	33.3	2	Area of circle using $A = \pi r^2$
53.5	33.3	2	Area of rectangle
53.5	33.3	3	Addition, whole numbers
53.5	33.3	3	Subtraction, whole numbers
53.5	33.3	3	Multiplication, whole numbers
53.5	33.3	3	Division, whole numbers
62.5	28.6	2	Addition of decimals
62.5	28.6	2	Subtraction of decimals
62.5	28.6	2	Multiplication of decimals
62.5	28.6	2	Division of decimals
65.5	14.3	1	Reading large numbers
65.5	14.3	1	Rounding numbers

TABLE 63  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF HEALTH ASSISTANT TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	20	Liquid measure
2.5	90	18	Temperature conversion
2.5	90	18	Addition, whole numbers
5	85	17	Subtraction, whole numbers
5	85	17	Multiplication, whole numbers
5	85	17	Reading, writing decimals
7	80	16	Division, whole numbers
8	75	15	Averages
9.5	70	14	Meaning of percentage
9.5	70	14	Changing per cent to decimals
12	65	13	Comparing fractions
12	65	13	Changing common fractions to decimals
12	65	13	Addition, fractions
16	60	12	Subtraction, fractions
16	60	12	Multiplication, fractions
16	60	12	Changing decimals to per cents
16	60	12	Addition, mixed numbers
16	60	12	Subtraction, mixed numbers
19.5	57.9	11	Reducing fractions to lowest terms
19.5	57.9	11	Reading large numbers
23.5	55	11	Division, fractions
23.5	55	11	Changing decimals to common fractions
23.5	55	11	Decimal equivalents
23.5	55	11	Multiplication, mixed numbers
23.5	55	11	Rounding numbers
23.5	55	11	Improper fractions, mixed numbers
28	50	10	Rounding off decimals
28	50	10	Finding per cent of a number
28	50	10	Division, mixed numbers
30	47.4	9	Reducing mixed numbers to simplest form
32.5	45	9	Addition of decimals
32.5	45	9	Subtraction of decimals
32.5	45	9	Multiplication of decimals
32.5	45	9	Changing common fractions to per cents
35	44.4	8	Ratio and proportion
37.5	42.1	8	Multiplying whole numbers and decimals by 10,100,etc.
37.5	42.1	8	Dividing whole numbers and decimals by 10,100,etc.
37.5	42.1	8	Finding what per cent one number is of another
37.5	42.1	8	Reading a rule
40.5	40	8	Division of decimals
40.5	40	8	Changing per cents to common fractions
42	36.8	7	Simple algebraic equation with one unknown
43	30	6	Finding what part one number is of another
44	27.8	5	Finding a number when a per cent of it is known
45	26.3	5	Finding a number when a fractional part of it is known
47.5	5.3	1	Micrometer reading
47.5	5.3	1	Area of circle
47.5	5.3	1	Area of triangle
47.5	5.3	1	Squaring a number
58	0	0	Measuring angles
58	0	0	Acute and obtuse angles
58	0	0	Finding length of unknown side of right triangle
58	0	0	Using $\pi$
58	0	0	Circumference using $C=\pi d=2\pi r$
58	0	0	Area of circle using $A=\pi r^2$
58	0	0	Area of rectangle
58	0	0	Area of square
58	0	0	Area of parallelogram
58	0	0	Volume of rectangular solid
58	0	0	Volume of cube
58	0	0	Volume of cylinder
58	0	0	Volume of sphere
58	0	0	Volume of cone
58	0	0	Volume of pyramid
58	0	0	Square root
58	0	0	Area of trapezoid

TABLE 64  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING HEALTH ASSISTANT STUDENT

RANK	PERCENT	NUMBER	SKILL
1	89.5	17	Temperature conversion
2	77.8	14	Changing per cent to decimals
3	75	15	Liquid measure
5.5	70.6	12	Changing common fractions to per cents
5.5	70.6	12	Finding per cent of a number
5.5	70.6	12	Changing decimals to per cents
5.5	70.6	12	Ratio and proportion
8.5	66.7	12	Meaning of percentage
8.5	66.7	12	Reading, writing decimals
10.5	64.7	11	Changing per cents to common fractions
10.5	64.7	11	Finding what per cent one number is of another
13	62.5	10	Finding a number when a per cent of it is known
13	62.5	10	Square root
13	62.5	10	Micrometer reading
16	58.8	10	Simple algebraic equation with one unknown
16	58.8	10	Improper fractions, mixed numbers
16	58.8	10	Reading a rule
16	58.8	10	Changing decimals to common fractions
16	58.8	10	Decimal equivalents
19.5	56.3	9	Multiplying whole numbers and decimals by 10,100, etc.
19.5	56.3	9	Dividing whole numbers and decimals by 10,100, etc.
21	56.3	9	Squaring a number
22.5	55.6	10	Comparing fractions
22.5	55.6	10	Changing common fractions to decimals
25	52.9	9	Area of triangle
25	52.9	9	Multiplication of decimals
25	52.9	9	Reducing mixed numbers to simplest form
28	50	9	Division, fractions
28	50	8	Area of trapezoid
28	50	9	Reducing fractions to lowest terms
33	47.1	8	Acute and obtuse angles
33	47.1	8	Finding length of unknown side of right triangle
33	47.1	8	Using $\pi$
33	47.1	8	Circumference using $C = \pi d = 2\pi r$
33	47.1	8	Division of decimals
33	47.1	8	Finding what part one number is of another
33	47.1	8	Multiplication, mixed numbers
37	44.4	8	Rounding off decimals
38	43.8	7	Finding a number when a fractional part of it is known
41	41.2	7	Measuring angles
41	42.1	8	Addition, fractions
41	42.1	8	Subtraction, fractions
41	41.2	7	Subtraction of decimals
41	41.2	7	Division, mixed numbers
47.5	47.1	8	Area of parallelogram
47.5	47.1	8	Area of circle
47.5	47.1	8	Volume of rectangular solid
47.5	47.1	8	Volume of cube
47.5	47.1	8	Volume of cylinder
47.5	47.1	8	Volume of sphere
47.5	47.1	8	Volume of cone
47.5	47.1	8	Volume of pyramid
53	41.2	7	Area of circle using $A = \pi r^2$
53	41.2	7	Area of rectangle
53	41.2	7	Area of square
56	38.9	7	Multiplication, fractions
56	38.9	7	Addition, mixed numbers
56	38.9	7	Subtraction, mixed numbers
58	35.3	6	Addition of decimals
59	33.3	6	Averages
60.5	22.2	4	Multiplication, whole numbers
60.5	22.2	4	Division, whole numbers
63	16.7	3	Subtraction, whole numbers
64	15.8	3	Addition, whole numbers
65	11.1	2	Rounding numbers
66	5.6	1	Reading large numbers

TABLE 65  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF HEALTH OTHER TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
3	95.8	23	Addition, whole numbers
3	95.8	23	Subtraction, whole numbers
3	95.8	23	Multiplication, whole numbers
3	95.8	23	Division, whole numbers
3	95.8	23	Liquid measure
6	87	20	Addition of decimals
8	83.3	20	Addition, fractions
8	83.3	20	Subtraction, fractions
8	83.3	20	Multiplication, fractions
15	82.6	19	Improper fractions, mixed numbers
15	82.6	19	Reducing mixed numbers to simplest form
15	82.6	19	Reducing fractions to lowest terms
15	82.6	19	Multiplication, mixed numbers
15	82.6	19	Multiplying whole numbers and decimals by 10,100,etc.
15	82.6	19	Division, fractions
15	82.6	19	Reading large numbers
15	82.6	19	Decimal equivalents
15	82.6	19	Subtraction of decimals
15	82.6	19	Multiplication of decimals
15	82.6	19	Meaning of percentage
25	78.3	18	Division, mixed numbers
25	78.3	18	Reading, writing decimals
25	78.3	18	Addition, mixed numbers
25	78.3	18	Subtraction, mixed numbers
25	78.3	18	Changing common fractions to decimals
25	78.3	18	Rounding numbers
25	78.3	18	Averages
25	78.3	18	Division of decimals
25	78.3	18	Dividing whole numbers and decimals by 10,100,etc.
31.5	73.9	17	Changing per cent to decimals
31.5	73.9	17	Changing decimals to per cents
31.5	73.9	17	Ratio and proportion
31.5	73.9	17	Rounding off decimals
34.5	69.6	16	Changing decimals in common fractions
34.5	69.6	16	Comparing fractions
36	66.7	16	Temperature conversion
37.5	65.2	15	Finding what part one number is of another
37.5	65.2	15	Changing common fractions to per cents
40	60.9	14	Finding per cent of a number
40	60.9	14	Finding what per cent one number is of another
40	60.9	14	Changing per cents to common fractions
42	56.5	13	Finding a number when a per cent of it is known
43.5	52.2	12	Simple algebraic equation with one unknown
43.5	52.2	12	Finding a number when a fractional part of it is known
45	27.3	6	Reading a rule
46	21.7	5	Squaring a number
47	13.6	3	Square root
48.5	13	3	Volume of cube
48.5	13	3	Volume of cylinder
50	9.1	2	Micrometer reading
52	8.7	2	Volume of sphere
52	8.7	2	Measuring angles
52	8.7	2	Volume of rectangular solid
55.5	4.3	1	Acute and obtuse angles
55.5	4.3	1	Area of circle
55.5	4.3	1	Area of rectangle
55.5	4.3	1	Area of square
62	0	0	Volume of cone
62	0	0	Volume of pyramid
62	0	0	Area of parallelogram
62	0	0	Area of triangle
62	0	0	Area of trapezoid
62	0	0	Finding length of unknown side of right triangle
62	0	0	Using pi $\pi$
62	0	0	Circumference using $C=\pi d=2\pi r$
62	0	0	Area of circle using $A=\pi r^2$

TABLE 66  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING HEALTH OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	95.7	22	Temperature conversion
2	91.3	21	Ratio and proportion
3.5	86.4	19	Finding what per cent one number is of another
3.5	86.4	19	Finding a number when a per cent of it is known
5	85	17	Micrometer reading
6	83.3	20	Liquid measure
7	82.6	19	Changing common fractions to per cents
8	81.8	18	Finding what part one number is of another
9	78.3	18	Changing decimals to per cents
10	77.3	17	Finding a number when a fractional part of it is known
12.5	75	15	Volume of sphere
12.5	75	15	Volume of cone
12.5	75	15	Volume of pyramid
12.5	75	15	Area of trapezoid
15.5	73.9	17	Changing common fractions to decimals
15.5	73.9	17	Changing per cent to decimals
17	71.4	15	Simple algebraic equation with one unknown
19	70	14	Measuring angles
19	70	14	Area of parallelogram
19	70	14	Volume of cylinder
21.5	69.6	16	Changing per cents to common fractions
21.5	69.6	16	Decimal equivalents
23	68.2	15	Finding per cent of a number
26.5	65	13	Using pi $\pi$
26.5	65	13	Circumference using $C = \pi d = 2\pi r$
26.5	65	13	Area of circle using $A = \pi r^2$
26.5	65	13	Acute and obtuse angles
26.5	65	13	Area of circle
26.5	65	13	Area of triangle
30	61.9	13	Reading a rule
33.5	60.9	14	Improper fractions, mixed numbers
33.5	60.9	14	Dividing whole numbers and decimals by 10,100,etc.
33.5	60.9	14	Changing decimals to common fractions
33.5	60.9	14	Division, mixed numbers
33.5	60.9	14	Reading, writing decimals
33.5	60.9	14	Rounding off decimals
38	60	12	Volume of rectangular solid
38	60	12	Volume of cube
38	60	12	Finding length of unknown side of right triangle
40	57.1	12	Square root
42.5	56.5	13	Division of decimals
42.5	56.5	13	Division, fractions
42.5	56.5	13	Reducing mixed numbers to simplest form
42.5	56.5	13	Multiplication, mixed numbers
45	54.2	13	Multiplication, fractions
46	52.4	11	Squaring a number
47	52.2	12	Comparing fractions
49	50	10	Area of rectangle
49	50	10	Area of square
49	50	11	Meaning of percentage
51	45.5	10	Reducing fractions to lowest terms
52.5	43.5	10	Addition, mixed numbers
52.5	43.5	10	Subtraction, mixed numbers
54	41.7	10	Subtraction, fractions
55	39.1	9	Multiplying whole numbers and decimals by 10,100,etc.
56	37.5	9	Addition, fractions
58	34.8	8	Addition of decimals
58	34.8	8	Averages
58	34.8	8	Multiplication of decimals
60	30.4	7	Rounding numbers
61	26.1	6	Subtraction of decimals
62.5	20.8	5	Multiplication, whole numbers
62.5	20.8	5	Division, whole numbers
64	17.4	4	Subtraction, whole numbers
65	13.6	3	Reading large numbers
66	12.5	3	Addition, whole numbers

TABLE 67  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF HEALTH OCCUPATIONS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1	98.1	Liquid measure
2	94.3	Addition, whole numbers
3.5	92.5	Subtraction, whole numbers
3.5	92.5	Multiplication, whole numbers
5	90.6	Division, whole numbers
6	80.4	Reading, writing decimals
7	76.5	Meaning of percentage
8	75	Temperature conversion
9	72.5	Averages
10	71.2	Multiplication, fractions
11	69.2	Addition, fractions
12.5	68.6	Changing per cent to decimals
12.5	68.6	Changing common fractions to decimals
14	67.3	Subtraction, fractions
15	67.2	Subtraction of decimals
16.5	66.7	Division, fractions
16.5	66.7	Addition of decimals
18	66	Reading large numbers
22.5	64.7	Addition, mixed numbers
22.5	64.7	Subtraction, mixed numbers
22.5	64.7	Multiplication, mixed numbers
22.5	64.7	Rounding off decimals
22.5	64.7	Improper fractions, mixed numbers
22.5	64.7	Multiplication of decimals
22.5	64.7	Changing decimals to per cents
22.5	64.7	Decimal equivalents
27	64	Reducing fractions to lowest terms
28.5	62.7	Comparing fractions
28.5	62.7	Rounding numbers
30	62	Reducing mixed numbers to simplest form
31	60.8	Division, mixed numbers
32	60	Multiplying whole numbers and decimals by 10, 100, etc.
33	52.9	Changing common fractions to per cents
34	59.2	Ratio and proportion
35	58.8	Division of decimals
36	58	Dividing whole numbers and decimals by 10, 100, etc.
37	56.9	Changing decimals to common fractions
38	54.9	Finding per cent of a number
39	46	Finding what per cent one number is of another
40	45.1	Changing per cents to common fractions
41	43.1	Finding what part one number is of another
42	40	Simple algebraic equation with one unknown
43	38.8	Finding a number when a per cent of it is known
44	36	Finding a number when a fractional part of it is known
45	34.7	Reading a rule
46	12	Squaring a number
47	10.2	Micrometer reading
48	10	Volume of cylinder
49	9.8	Measuring angles
50	8	Volume of cube
51	7.8	Acute and obtuse angles
52	6.1	Square root
54	6	Area of circle
54	6	Volume of rectangular solid
54	6	Volume of sphere
56.5	4	Area of triangle
56.5	4	Area of square
60	2	Area of rectangle
60	2	Area of trapezoid
60	2	Area of parallelogram
60	2	Volume of cone
60	2	Volume of pyramid
64.5	0	Finding length of unknown side of right triangle
64.5	0	Using $\pi$
64.5	0	Circumference using $C = \pi d = 2\pi r$
64.5	0	Area of circle using $A = \pi r^2$

TABLE 68

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF THE  
TOTAL SAMPLE OF TEACHERS OF HEALTH OCCUPATIONS WHO FELT THAT THE SKILL  
WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	87.8	Temperature conversion
2	78.7	Ratio and proportion
3	77.4	Liquid measure
4	73.9	Changing common fractions to per cents
5	72.7	Finding a number when a per cent of it is known
6	72.3	Changing per cent to decimals
7.5	71.7	Changing decimals to per cents
7.5	71.7	Finding what per cent one number is of another
9	71.4	Micrometer reading
10	65.2	Finding per cent of a number
11	64.4	Finding what part one number is of another
12.5	63.8	Changing common fractions to decimals
12.5	63.8	Decimal equivalents
14	63	Changing per cents to common fractions
15	62.5	Reading, writing decimals
16	61.9	Area of trapezoid
17.5	61.4	Finding a number when a fractional part of it is known
17.5	61.4	Simple algebraic equation with one unknown
19	60.9	Improper fractions, mixed numbers
20	60.8	Volume of cone
21.5	60.5	Volume of sphere
21.5	60.5	Volume of pyramid
23	59.6	Meaning of percentage
24	58.7	Changing decimals to common fractions
25.5	58.1	Area of parallelogram
25.5	58.1	Area of triangle
27	57.8	Reading a rule
28	56.8	Volume of cylinder
29	56.5	Dividing whole numbers and decimals by 10, 100, etc.
30.5	55.8	Square root
30.5	55.8	Area of circle
32.5	55.6	Measuring angles
32.5	55.6	Acute and obtuse angles
34	55.3	Comparing fractions
35	54.3	Reducing mixed numbers to simplest form
36	54.2	Rounding off decimals
38.5	53.5	Using pi $\pi$
38.5	53.5	Circumference using $C = \pi d = 2\pi r$
38.5	53.5	Volume of rectangular solid
38.5	53.5	Volume of cube
41	53.2	Division, fractions
42.5	52.2	Multiplication, mixed numbers
42.5	52.2	Division, mixed numbers
45	51.2	Area of circle using $A = \pi r^2$
45	51.2	Finding length of unknown side of right triangle
45	51.2	Squaring a number
47.5	50	Reducing fractions to lowest terms
47.5	50	Multiplication, fractions
49	48.9	Division of decimals
50	46.5	Area of square
51	45.7	Multiplying whole numbers and decimals by 10, 100, etc.
52	44.9	Subtraction, fractions
53	44.2	Area of rectangle
54	42.9	Addition, fractions
55.5	42.6	Addition, mixed numbers
55.5	42.6	Subtraction, mixed numbers
57	40.4	Multiplication of decimals
58	39.6	Averages
59	34	Addition of decimals
60	31.9	Subtraction of decimals
61.5	23.5	Multiplication, whole numbers
61.5	23.5	Division, whole numbers
63	20.8	Rounding numbers
64	20	Subtraction, whole numbers
65	17.3	Addition, whole numbers
66	10.6	Reading large numbers



TABLE 69

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AGRICULTURAL MECHANICS TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
8	100	15	Rounding numbers
8	100	15	Addition, whole numbers
8	100	15	Subtraction, whole numbers
8	100	15	Multiplication, whole numbers
8	100	15	Division, whole numbers
8	100	15	Averages
8	100	15	Addition of decimals
8	100	15	Subtraction of decimals
8	100	15	Multiplication of decimals
8	100	15	Division of decimals
8	100	15	Changing decimals to common fractions
8	100	15	Reading a rule
8	100	15	Micrometer reading
8	100	15	Meaning of percentage
8	100	15	Changing common fractions to decimals
19	93.3	14	Addition, fractions
19	93.3	14	Subtraction, fractions
19	93.3	14	Decimal equivalents
19	93.3	14	Reading, writing decimals
19	93.3	14	Rounding off decimals
19	93.3	14	Finding per cent of a number
19	93.3	14	Ratio and proportion
23	92.9	13	Reducing fractions to lowest terms
28.5	86.7	13	Multiplication, fractions
28.5	86.7	13	Division, fractions
28.5	86.7	13	Comparing fractions
28.5	86.7	13	Area of rectangle
28.5	86.7	13	Area of square
28.5	86.7	13	Multiplication, mixed numbers
28.5	86.7	13	Division, mixed numbers
28.5	86.7	13	Liquid measure
28.5	86.7	13	Addition, mixed numbers
28.5	86.7	13	Finding what per cent one number is of another
34	85.7	12	Changing per cent to decimals
39	80	12	Changing decimals to per cents
39	80	12	Changing per cents to common fractions
39	80	12	Multiplying whole numbers and decimals by 10,100, etc.
39	80	12	Dividing whole numbers and decimals by 10,100,etc.
39	80	12	Reducing mixed numbers to simplest form
39	80	12	Circumference using $C = \pi d = 2\pi r$
39	80	12	Subtraction, mixed numbers
39	80	12	Squaring a number
39	80	12	Volume of cylinder
47	73.3	11	Area of circle
47	73.3	11	Volume of rectangular solid
47	73.3	11	Changing common fractions to per cents
47	73.3	11	Reading large numbers
47	73.3	11	Area of circle using $A = \pi r^2$
47	73.3	11	Using $\pi$
47	73.3	11	Finding what part one number is of another
51	71.4	10	Finding a number when a fractional part of it is known
52.5	66.7	10	Improper fractions, mixed numbers
52.5	66.7	10	Finding a number when a per cent of it is known
54.5	60	9	Simple algebraic equation with one unknown
54.5	60	9	Volume of cube
56.5	53.3	8	Measuring angles
56.5	53.3	8	Area of triangle
58.5	46.7	7	Square root
58.5	46.7	7	Finding length of unknown side of triangle
60	40	6	Temperature conversion
62	33.3	5	Area of trapezoid
62	33.3	5	Acute and obtuse angles
62	33.3	5	Area of parallelogram
64	26.7	4	Volume of sphere
65.5	20	3	Volume of cone
65.5	20	3	Volume of pyramid

TABLE 70

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING AGRICULTURAL MECHANICS STUDENT

RANK	PERCENT	NUMBER	SKILL
2	86.7	13	Circumference using $C = \pi d = 2\pi r$
2	86.7	13	Area of triangle
2	86.7	13	Simple algebraic equation with one unknown
4	85.7	12	Area of circle using $A = \pi r^2$
9	80	12	Ratio and proportion
9	80	12	Division, fractions
9	80	12	Finding length of unknown side of right triangle
9	80	12	Using $\pi$
9	80	12	Changing common fractions to per cents
9	80	12	Area of trapezoid
9	80	12	Area of circle
9	80	12	Decimal equivalents
9	80	12	Finding what part one number is of another
14.5	78.6	11	Volume of cylinder
14.5	78.6	11	Volume of pyramid
16	76.9	10	Finding a number when a fractional part of it is known
20	73.3	11	Improper fractions, mixed numbers
20	73.3	11	Finding what per cent one number is of another
20	73.3	11	Multiplication, fractions
20	73.3	11	Changing per cents to common fractions
20	73.3	11	Square root
20	73.3	11	Micrometer reading
20	73.3	11	Changing common fractions to decimals
24.5	71.4	10	Temperature conversion
24.5	71.4	10	Volume of cube
27	66.7	10	Finding a number when a per cent of it is known
27	66.7	10	Changing decimals to common fractions
27	66.7	10	Area of parallelogram
29.5	64.3	9	Volume of sphere
29.5	64.3	9	Volume of cone
31.5	60	9	Reducing mixed numbers to simplest form
31.5	60	9	Volume of rectangular solid
33.5	57.1	8	Reducing fractions to lowest terms
33.5	57.1	8	Measuring angles
37.5	53.3	8	Division, mixed numbers
37.5	53.3	8	Comparing fractions
37.5	53.3	8	Changing decimals to per cents
37.5	53.3	8	Squaring a number
37.5	53.3	8	Area of rectangle
37.5	53.3	8	Area of square
42	50	7	Acute and obtuse angles
42	50	7	Addition, fractions
42	50	7	Subtraction, fractions
44.5	46.7	7	Reading a rule
44.5	46.7	7	Multiplication, mixed numbers
46.5	46.2	6	Multiplication of decimals
46.5	46.2	6	Division of decimals
48	42.9	6	Changing per cent to decimals
50	40	6	Reading, writing decimals
50	40	6	Liquid measure
50	40	6	Finding per cent of a number
52.5	33.3	5	Rounding off decimals
52.5	33.3	5	Subtraction of decimals
56	26.7	4	Multiplying whole numbers and decimals by 10,100,etc.
56	26.7	4	Dividing whole numbers and decimals by 10,100,etc.
56	26.7	4	Meaning of percentage
56	26.7	4	Addition of decimals
56	26.7	4	Division, whole numbers
60.5	20	3	Averages
60.5	20	3	Addition, mixed numbers
60.5	20	3	Subtraction, mixed numbers
60.5	20	3	Reading large numbers
64	13.3	2	Subtraction, whole numbers
64	13.3	2	Multiplication, whole numbers
64	13.3	2	Rounding numbers
66	6.3	1	Addition, whole numbers

TABLE 71  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AGRICULTURE/OTHER TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
3.5	100	48	Addition, whole numbers
3.5	100	48	Subtraction, whole numbers
3.5	100	48	Multiplication, whole numbers
3.5	100	48	Division, whole numbers
3.5	100	48	Reading, writing decimals
3.5	100	47	Meaning of percentage
8	97.9	46	Addition of decimals
8	97.9	46	Subtraction of decimals
8	97.9	46	Multiplication of decimals
10	95.8	46	Averages
11	95.7	44	Reading a rule
13	93.8	45	Liquid measure
13	93.8	45	Rounding off decimals
13	93.8	45	Changing common fractions to decimals
16	93.6	44	Division of decimals
16	93.6	44	Multiplying whole numbers and decimals by 10,100,etc.
16	93.6	44	Dividing whole numbers and decimals by 10,100,etc.
18.5	89.6	43	Ratio and proportion
18.5	89.6	43	Area of square
20.5	89.4	42	Changing per cent to decimals
20.5	89.4	42	Changing decimals to per cents
22.5	87.5	42	Area of rectangle
22.5	87.5	42	Addition, fractions
24	86.2	38	Micrometer reading
25.5	85.4	41	Addition, mixed numbers
25.5	85.4	41	Measuring angles
27	85.1	40	Volume of rectangular solid
29.5	83.3	40	Subtraction, fractions
29.5	83.3	40	Comparing fractions
29.5	83.3	40	Rounding numbers
29.5	83.3	40	Subtraction, mixed numbers
32	83	39	Finding what per cent one number is of another
34	81.3	39	Reading large numbers
34	81.3	39	Reducing fractions to lowest terms
34	81.3	39	Multiplication, mixed numbers
36	80.9	38	Finding per cent of a number
38	79.2	38	Circumference using $C = \pi d = 2\pi r$
38	79.2	38	Division, mixed numbers
38	79.2	38	Volume of cube
40.5	76.6	36	Changing common fractions to per cents
40.5	76.6	36	Area of circle
42	76.1	35	Decimal equivalents
44.5	75	36	Area of triangle
44.5	75	36	Using $\pi$
44.5	75	36	Volume of cylinder
44.5	75	36	Multiplication, fractions
47.5	74.5	35	Changing decimals to common fractions
47.5	74.5	35	Reducing mixed numbers to simplest form
49	72.9	35	Area of circle using $A = \pi r^2$
50.5	72.3	34	Changing per cents to common fractions
50.5	72.3	34	Simple algebraic equation with one unknown
52	70.8	34	Division, fractions
53	70.2	33	Finding what part one number is of another
54.5	68.1	32	Improper fractions, mixed numbers
54.5	68.1	32	Finding a number when a per cent of it is known
56	66	31	Area of parallelogram
57	61.7	29	Finding a number when a fractional part of it is known
58.5	59.6	28	Area of trapezoid
58.5	59.6	28	Squaring a number
60	56.3	27	Temperature conversion
61	54.2	26	Finding length of unknown side of right triangle
62	51.1	24	Volume of cone
63	47.9	23	Acute and obtuse angles
64	42.6	20	Volume of sphere
65	39.1	18	Volume of pyramid
66	36.2	17	Square root

TABLE 72  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING AGRICULTURE OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	91.5	43	Volume of cylinder
2.5	91.3	42	Volume of sphere
2.5	91.3	42	Volume of cone
4	89.4	42	Simple algebraic equation with one unknown
5	89.1	41	Volume of pyramid
6	88.6	39	Square root
7	87.2	41	Finding length of unknown side of right triangle
8.5	87	40	Division, fractions
8.5	87	40	Area of trapezoid
10	86.7	39	Finding a number when a fractional part of it is known
11	85.4	41	Ratio and proportion
12.5	84.8	39	Micrometer reading
12.5	84.8	39	Area of parallelogram
14	84.1	37	Decimal equivalents
15	83.3	40	Circumference using $C = \pi d = 2\pi r$
16	83	39	Volume of rectangular solid
17	82.6	38	Multiplication, fractions
18.5	82.2	37	Changing decimals to common fractions
18.5	82.2	37	Finding a number when a per cent of it is known
20	81.3	39	Using $\pi$
21	80.9	38	Acute and obtuse angles
22.5	80.4	37	Comparing fractions
22.5	80.4	37	Area of circle using $A = \pi r^2$
24	79.5	35	Finding what per cent one number is of another
25	79.2	38	Changing common fractions to decimals
26	78.7	37	Division, mixed numbers
27.5	78.3	36	Improper fractions, mixed numbers
27.5	78.3	36	Multiplication, mixed numbers
29	77.8	35	Finding what part one number is of another
30.5	77.1	37	Measuring angles
30.5	77.1	37	Area of triangle
32.5	76.6	36	Subtraction, fractions
32.5	76.6	36	Area of circle
34	75	36	Volume of cube
36	73.9	34	Changing per cents to common fractions
36	73.9	34	Reducing fractions to lowest terms
36	73.9	34	Reducing mixed numbers to simplest form
38	73.3	33	Finding per cent of a number
39	72.9	38	Temperature conversion
40	68.1	32	Addition, fractions
42.5	67.4	31	Subtraction, mixed numbers
42.5	67.4	31	Changing per cent to decimals
42.5	67.4	31	Changing decimals to per cents
42.5	67.4	31	Changing common fractions to per cents
45	61.7	29	Addition, mixed numbers
46.5	58.3	28	Reading, writing decimals
46.5	58.3	28	Rounding off decimals
48	54.5	24	Squaring a number
49	53.3	24	Reading a rule
50	52.2	24	Division of decimals
51.5	47.9	23	Liquid measure
51.5	47.9	23	Area of rectangle
53.5	46.7	21	Dividing whole numbers and decimals by 10,100,etc.
53.5	46.7	21	Meaning of percentage
55.5	43.8	21	Area of square
55.5	43.8	21	Averages
57	41.3	19	Multiplication of decimals
58	35.6	16	Multiplying whole numbers and decimals by 10,100,etc.
59	27.7	13	Rounding numbers
60	23.9	11	Subtraction of decimals
61	22.9	11	Division, whole numbers
62	21.7	10	Addition of decimals
63	18.8	9	Multiplication, whole numbers
64	17	8	Reading large numbers
65.5	14.6	7	Addition, whole numbers
65.5	14.6	7	Subtraction, whole numbers

TABLE 73

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF AGRICULTURAL PRODUCTION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	96	Reading a rule
2.5	99	97	Multiplication, whole numbers
2.5	99	97	Division, whole numbers
4.5	98	96	Addition, whole numbers
4.5	98	96	Subtraction, whole numbers
7	97.9	95	Meaning of percentage
7	97.9	94	Changing per cent to decimals
7	97.9	93	Changing decimals to per cents
9	96.9	95	Reading, writing decimals
10	95.9	94	Liquid measure
11	95.8	92	Finding per cent of a number
12.5	94.9	93	Rounding off decimals
12.5	94.9	93	Averages
14	93.9	92	Area of square
15	93.8	90	Micrometer reading
17	92.9	91	Addition of decimals
17	92.9	91	Subtraction of decimals
17	92.9	91	Area of rectangle
19	91.8	90	Multiplying whole numbers and decimals by 10, 100, etc.
20	90.8	89	Addition, mixed numbers
21	90.7	88	Multiplication of decimals
22	89.8	88	Division of decimals
23	89.7	87	Dividing whole numbers and decimals by 10, 100, etc.
24	89.6	86	Rounding numbers
25.5	89.4	84	Finding what part one number is of another
25.5	89.4	84	Finding what per cent one number is of another
27	88.8	87	Changing common fractions to decimals
28.5	87.8	86	Ratio and proportion
28.5	87.8	86	Subtraction, mixed numbers
31.5	86.7	85	Reducing fractions to lowest terms
31.5	86.7	85	Addition, fractions
31.5	86.7	85	Subtraction, fractions
31.5	86.7	85	Measuring angles
34.5	84.2	80	Finding a number when a per cent of it is known
34.5	84.2	80	Reading large numbers
36	83.7	82	Multiplication, fractions
38	82.7	81	Reducing mixed numbers to simplest form
38	82.7	81	Multiplication, mixed numbers
38	82.7	81	Comparing fractions
40	82.5	80	Division, fractions
41	82.1	78	Changing common fractions to per cents
42	81.6	80	Volume of cylinder
43	81.4	79	Area of circle
44	80.4	78	Division, mixed numbers
45	79.6	78	Volume of rectangular solid
46	79.2	76	Changing per cents to common fractions
47.5	78.6	77	Decimal equivalents
47.5	78.6	77	Volume of cube
49	76.3	74	Improper fractions, mixed numbers
50	75.5	74	Area of circle using $A = \pi r^2$
51	74.5	73	Changing decimals to common fractions
52	74.2	69	Finding a number when a fractional part of it is known
53	73.5	72	Using pi $\pi$
54.5	72.4	71	Circumference using $C = \pi d = 2\pi r$
54.5	72.4	71	Area of triangle
56	69.1	67	Simple algebraic equation with one unknown
57	68.8	66	Squaring a number
58	57.1	56	Area of parallelogram
59	55.1	54	Finding length of unknown side of right triangle
60	50	49	Temperature conversion
61	49	47	Area of trapezoid
62	43.2	41	Volume of sphere
63	38.1	37	Acute and obtuse angles
64	34	32	Square root
65	35.4	34	Volume of cone
66	31.3	30	Volume of pyramid

TABLE 74  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING AGRICULTURE PRODUCTION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	91.7	88	Ratio and proportion
2	88.4	84	Volume of cylinder
3	85.1	80	Volume of sphere
4	82.3	80	Area of circle
5	83.2	79	Finding length of unknown side of right triangle
6	82.1	78	Simple algebraic equation with one unknown
7.5	81.9	77	Volume of cone
7.5	81.9	77	Volume of pyramid
9	81.7	76	Temperature conversion
10	80.9	76	Acute and obtuse angles
11	80.6	75	Finding a number when a fractional part of it is known
12.5	79.4	77	Circumference using $C = \pi d = 2\pi r$
12.5	79.4	77	Measuring angles
14.5	78.9	75	Area of circle using $A = \pi r^2$
14.5	78.9	75	Area of trapezoid
16	78.7	74	Decimal equivalents
17	77.3	75	Division, fractions
18	76.7	63	Square root
19	76.6	72	Finding what part one number is of another
20	76.3	71	Finding a number when a per cent of it is known
21	76	73	Changing decimals to common fractions
22.5	75.3	70	Finding what per cent one number is of another
22.5	75.3	73	Area of triangle
24	75	72	Volume of cube
25	74	71	Area of parallelogram
26.5	72.9	70	Micrometer reading
26.5	72.9	70	Division, mixed numbers
28	71.6	68	Changing common fractions to decimals
29	71.3	67	Changing per cents to common fractions
30	71.1	69	Multiplication, fractions
31.5	70.8	68	Volume of rectangular solid
31.5	70.8	68	Improper fractions, mixed numbers
33	70.7	65	Changing common fractions to per cents
34	70.5	67	Finding per cent of a number
35	70.1	68	Using pi $\pi$
36	69.9	65	Reducing mixed numbers to simplest form
37	69.5	66	Multiplication, mixed numbers
38	68	66	Comparing fractions
39	64.6	62	Changing decimals to per cents
40	64.3	63	Subtraction, fractions
41	62.9	61	Reducing fractions to lowest terms
42	62.2	61	Addition, fractions
43	62.1	59	Changing per cent to decimals
44	60.4	58	Subtraction, mixed numbers
45	58.8	57	Reading, writing decimals
46	57.6	53	Squaring a number
47.5	57.3	55	Addition, mixed numbers
47.5	57.3	55	Meaning of percentage
49	55.2	53	Division of decimals
50	50.5	49	Rounding off decimals
51	50	47	Multiplication of decimals
52	48	47	Liquid measure
53	46.8	44	Reading a rule
54.5	42.9	42	Averages
54.5	42.9	42	Area of rectangle
56	39.4	37	Dividing whole numbers and decimals by 10, 100, etc.
57	35.1	34	Area of square
58	34.7	33	Multiplying whole numbers and decimals by 10,100,etc.
59	33.3	32	Addition of decimals
60	31.3	30	Subtraction of decimals
61	27.6	27	Division, whole numbers
62	27.4	26	Reading large numbers
63	25	24	Rounding numbers
64	23.5	23	Multiplication, whole numbers
65	15.3	15	Subtraction, whole numbers
66	12.2	12	Addition, whole numbers

TABLE 75  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF HORTICULTURE TEACHERS WHO FELT THAT THE SKILL :  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
4.5	94.4	17	Reading a rule
4.5	94.4	17	Reading, writing decimals
4.5	94.4	17	Rounding off decimals
4.5	94.4	17	Changing common fractions to decimals
4.5	94.4	17	Addition, whole numbers
4.5	94.4	17	Subtraction, whole numbers
4.5	94.4	17	Multiplication, whole numbers
4.5	94.4	17	Division, whole numbers
12.5	88.9	16	Addition of decimals
12.5	88.9	16	Subtraction of decimals
12.5	88.9	16	Multiplication of decimals
12.5	88.9	16	Division of decimals
12.5	88.9	16	Multiplying whole numbers and decimals by 10,100,etc.
12.5	88.9	16	Averages
12.5	88.9	16	Liquid measure
12.5	88.9	16	Meaning of percentage
18.5	83.3	15	Rounding numbers
18.5	83.3	15	Dividing whole numbers and decimals by 10,100, etc.
18.5	83.3	15	Area of rectangle
18.5	83.3	15	Area of square
24	77.8	14	Changing per cent to decimals
24	77.8	14	Changing decimals to per cents
24	77.8	14	Finding per cent of a number
24	77.8	14	Multiplication, fractions
24	77.8	14	Changing decimals to common fractions
24	77.8	14	Ratio and proportion
24	77.8	14	Reducing fractions to lowest
28	76.5	13	Multiplication, mixed numbers
30.5	72.2	13	Addition, fractions
30.5	72.2	13	Subtraction, fractions
30.5	72.2	13	Division, fractions
30.5	72.2	13	Area of circle
33	70.6	12	Reading large numbers
36.5	66.7	12	Temperature conversion
36.5	66.7	12	Volume of cube
36.5	66.7	12	Division, mixed numbers
36.5	66.7	12	Addition, mixed numbers
36.5	66.7	12	Decimal equivalents
36.5	66.7	12	Changing common fractions to per cents
42.5	61.1	11	Finding what per cent one number is of another
42.5	61.1	11	Finding a number when a per cent of it is known
42.5	61.1	11	Subtraction, mixed numbers
42.5	61.1	11	Changing per cents to common fractions
42.5	61.1	11	Micrometer reading
42.5	61.1	11	Measuring angles
48.5	55.6	10	Area of circle using $A = \pi r^2$
48.5	55.6	10	Area of triangle
48.5	55.6	10	Simple algebraic equation with one unknown
48.5	55.6	10	Finding what part one number is of another
48.5	55.6	10	Reducing mixed numbers to simplest form
48.5	55.6	10	Volume of rectangular solid
54	50	9	Comparing fractions
54	50	9	Improper fractions, mixed
54	50	9	Finding a number when a fractional part of it is known
54	50	9	Using $\pi$
54	50	9	Circumference using $C = \pi d = 2\pi r$
57.5	44.4	8	Squaring a number
57.5	44.4	8	Area of parallelogram
59	33.3	6	Acute and obtuse angles
60	27.8	5	Volume of cylinder
61	22.2	4	Square root
62.5	16.7	3	Volume of pyramid
62.5	16.7	3	Area of trapezoid
64.5	11.1	2	Volume of sphere
64.5	11.1	2	Finding length of unknown side of right triangle
66	5.6	1	Volume of cone

TABLE 76

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING HORTICULTURE STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	76.5	13	Measuring angles
1.5	76.5	13	Area of parallelogram
3	75	12	Circumference using $C = \pi d = 2\pi r$
4	70.6	12	Finding a number when a fractional part of it is known
5.5	68.8	11	Volume of cone
5.5	68.8	11	Volume of pyramid
10	66.7	12	Simple algebraic equation with one unknown
10	66.7	12	Ratio and proportion
10	66.7	12	Averages
10	66.7	12	Reducing fractions to lowest terms
10	66.7	12	Changing decimals to common fractions
10	66.7	12	Reading, writing decimals
10	66.7	12	Volume of sphere
15.5	64.7	11	Multiplication of decimals
15.5	64.7	11	Area of triangle
15.5	64.7	11	Area of trapezoid
15.5	64.7	11	Using pi $\pi$
18.5	62.5	10	Finding length of unknown side of right triangle
18.5	62.5	10	Volume of cylinder
20.5	61.1	11	Rounding off decimals
20.5	61.1	11	Squaring a number
22	60	9	Temperature conversion
27	58.8	10	Micrometer reading
27	58.8	10	Finding what per cent one number is of another
27	58.8	10	Finding a number when a per cent of it is known
27	58.8	10	Finding what part one number is of another
27	58.8	10	Area of circle using $A = \pi r^2$
27	58.8	10	Addition of decimals
27	58.8	10	Division, fractions
27	58.8	10	Addition, fractions
27	58.8	10	Meaning of percentage
33.5	56.3	9	Acute and obtuse angles
33.5	56.3	9	Changing per cent to decimals
33.5	56.3	9	Changing decimals to per cents
33.5	56.3	9	Dividing whole numbers and decimals by 10, 100, etc.
38.5	55.6	10	Volume of rectangular solid
38.5	55.6	10	Volume of cube
38.5	55.6	10	Rounding numbers
38.5	55.6	10	Multiplication, fractions
38.5	55.6	10	Changing common fractions to decimals
38.5	55.6	10	Area of rectangle
45	52.9	9	Area of circle
45	52.9	9	Division of decimals
45	52.9	9	Multiplying whole numbers and decimals by 10, 100, etc.
45	52.9	9	Subtraction of decimals
45	52.9	9	Liquid measure
45	52.9	9	Finding per cent of a number
45	52.9	9	Square root
51	50	9	Area of square
51	50	8	Changing per cents to common fractions
51	50	8	Changing common fractions to per cents
51	50	8	Decimal equivalents
51	50	9	Division, whole numbers
56	47.1	8	Improper fractions, mixed numbers
56	47.1	8	Subtraction, fractions
56	47.1	8	Division, mixed numbers
56	47.1	8	Subtraction, mixed numbers
56	47.1	8	Multiplication, mixed numbers
60	44.4	8	Reading large numbers
60	44.4	8	Addition, mixed numbers
60	44.4	8	Reading a rule
62	41.2	7	Reducing mixed numbers to simplest form
63	38.9	7	Multiplication, whole numbers
64	35.3	6	Comparing fractions
65.5	33.3	6	Addition, whole numbers
65.5	33.3	6	Subtraction, whole numbers



TABLE 77  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF AGRICULTURE OCCUPATIONS WHO FELT THAT THE  
SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1.5	98.9	Multiplication, whole numbers
1.5	98.9	Division, whole numbers
4	98.3	Reading a rule
4	98.3	Addition, whole numbers
4	98.3	Subtraction, whole numbers
6	97.7	Meaning of percentage
7	97.2	Reading, writing decimals
8	95	Averages
10	94.4	Addition of decimals
10	94.4	Subtraction of decimals
10	94.4	Rounding off decimals
12	93.9	Liquid measure
13	93.2	Multiplication of decimals
14	92.6	Changing per cent to decimals
15	92	Changing decimals to per cents
16.5	91.6	Division of decimals
16.5	91.6	Changing common fractions to decimals
18	91.1	Area of square
19	91	Multiplying whole numbers and decimals by 10,100, etc.
20	89.9	Area of rectangle
21	89.8	Finding per cent of a number
22	89.3	Dividing whole numbers and decimals by 10,100, etc.
23	88.1	Rounding numbers
24	88	Micrometer reading
25	87.7	Ratio and proportion
26	86.6	Addition, mixed numbers
27	86	Addition, fractions
28	84.9	Subtraction, fractions
29	84.8	Reducing fractions to lowest terms
30	84.5	Finding what per cent one number is of another
31	83.2	Subtraction, mixed numbers
32	82	Multiplication, mixed numbers
33	81.1	Reading large numbers
34.5	81	Measuring angles
34.5	81	Multiplication, fractions
36	79.9	Comparing fractions
37	79.3	Finding what part one number is of another
38	79.2	Division, mixed numbers
39	78.7	Division, fractions
40	78.5	Area of circle
41	78.3	Changing common fractions to per cents
42	78.1	Volume of rectangular solid
43	78	Decimal equivalents
44	77.5	Reducing mixed numbers to simplest form
45	77	Changing decimals to common fractions
46.5	76	Finding a number when a per cent of it is known
46.5	76	Volume of cube
48	75.6	Changing per cents to common fractions
49	74.3	Volume of cylinder
50.5	72.6	Circumference using $C = \pi d = 2\pi r$
50.5	72.6	Area of circle using $A = \pi r^2$
52	71.5	Using $\pi$
53	70.6	Improper fractions, mixed numbers
54	69.8	Area of triangle
55	68	Finding a number when a fractional part of it is known
56	67.8	Simple algebraic equation with one unknown
57	64.8	Squaring a number
58	56.2	Area of parallelogram
59	52.5	Temperature conversion
60	49.7	Finding length of unknown side of right triangle
61	47.2	Area of trapezoid
62	39.9	Acute and obtuse angles
63	38.3	Volume of sphere
64	34.5	Square root
65	35.2	Volume of cone
66	30.9	Volume of pyramid

TABLE 78  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF AGRICULTURE OCCUPATIONS WHO FELT THAT  
THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	86.4	Ratio and proportion
2	86	Volume of cylinder
3	83.1	Volume of sphere
4	82.9	Simple algebraic equation with one unknown
5	82.4	Volume of pyramid
6	81.8	Volume of cone
7	82.1	Finding length of unknown side of right triangle
8	81	Finding a number when a fractional part of it is known
9	80.7	Circumference using $C=\pi d=2\pi r$
10	79.8	Area of trapezoid
11.5	78.3	Area of circle
11.5	78.3	Division, fractions
13	78.2	Temperature conversion
14	77.9	Area of circle using $A=\pi r^2$
15	77.5	Decimal equivalents
16	77.1	Square root
17	76.7	Measuring angles
18	76.4	Area of parallelogram
19	76	Acute and obtuse angles
20	75.9	Changing decimals to common fractions
21	75.7	Area of triangle
22	75.4	Finding what part one number is of another
23	75.3	Finding a number when a per cent of it is known
24	74.7	Micrometer reading
25	74.6	Finding what per cent one number is of another
26	73.4	Using $\pi$
27.5	72.7	Volume of cube
27.5	72.7	Multiplication, fractions
29	72.2	Changing common fractions to decimals
30	71.6	Volume of rectangular solid
31	70.7	Improper fractions, mixed numbers
32	70.3	Division, mixed numbers
33	70.2	Changing per cents to common fractions
34	68.6	Changing common fractions to per cents
35	67.6	Multiplication, mixed numbers
36	67.3	Reducing mixed numbers to simplest form
37.5	66.9	Finding per cent of a number
37.5	66.9	Comparing fractions
39	65.7	Reducing fractions to lowest terms
40	64.8	Subtraction, fractions
41	63.6	Changing decimals to per cents
42	62.5	Addition, fractions
43	61.4	Changing per cent to decimals
44	57.9	Reading, writing decimals
45	57.5	Subtraction, mixed numbers
46	56.8	Squaring a number
47	52.2	Rounding off decimals
48	52	Meaning of percentage
49	54	Addition, mixed numbers
50	53.5	Division of decimals
51	48.8	Multiplication of decimals
52	48.3	Reading a rule
53	47.8	Liquid measure
54	46.4	Area of rectangle
55	43.6	Averages
56	41.8	Dividing whole numbers and decimals by 10, 100, etc.
57	40.4	Area of square
58	36	Multiplying whole numbers and decimals by 10, 100, etc.
59	32.2	Addition of decimals
60	31.6	Subtraction of decimals
62	27.8	Rounding numbers
61	28.5	Division, whole numbers
63	25.7	Reading large numbers
64	22.9	Multiplication, whole numbers
65	16.8	Subtraction, whole numbers
66	14.1	Addition, whole numbers

TABLE 79  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CHILD CARE GUIDANCE TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2.5	83.3	10	Averages
2.5	83.3	10	Subtraction, whole numbers
2.5	83.3	10	Addition, whole numbers
2.5	83.3	10	Multiplication, whole numbers
5	75	9	Division, whole numbers
8	66.7	8	Changing decimals to per cents
8	66.7	8	Addition, fractions
8	66.7	8	Changing per cent to decimals
8	66.7	8	Multiplying whole numbers and decimals by 10, 100, etc.
8	66.7	8	Finding per cent of a number
16.5	58.3	7	Subtraction, fractions
16.5	58.3	7	Division, fractions
16.5	58.3	7	Dividing whole numbers and decimals by 10, 100, etc.
16.5	58.3	7	Multiplication of decimals
16.5	58.3	7	Subtraction of decimals
16.5	58.3	7	Reducing fractions to lowest terms
16.5	58.3	7	Multiplication, fractions
16.5	58.3	7	Division of decimals
16.5	58.3	7	Changing common fractions to per cents
16.5	58.3	7	Addition of decimals
16.5	58.3	7	Liquid measure
16.5	58.3	7	Meaning of percentage
23	54.5	6	Changing decimals to common fractions
27.5	50	6	Changing per cents to common fractions
27.5	50	6	Decimal equivalents
27.5	50	6	Reading a rule
27.5	50	6	Comparing fractions
27.5	50	6	Addition, mixed numbers
27.5	50	6	Rounding numbers
27.5	50	6	Multiplication, mixed numbers
27.5	50	6	Finding what per cent one number is of another
35.5	41.7	5	Reducing mixed numbers to simplest form
35.5	41.7	5	Improper fractions, mixed numbers
35.5	41.7	5	Division, mixed numbers
35.5	41.7	5	Reading, writing decimals
35.5	41.7	5	Subtraction, mixed numbers
35.5	41.7	5	Reading large numbers
35.5	41.7	5	Changing common fractions to decimals
35.5	41.7	5	Rounding off decimals
41	33.3	4	Finding what part one number is of another
41	33.3	4	Finding a number when a fractional part of it is known
41	33.3	4	Ratio and proportion
43.5	25	3	Area of square
43.5	25	3	Temperature conversion
47.5	16.7	2	Area of rectangle
47.5	16.7	2	Simple algebraic equation with one unknown
47.5	16.7	2	Measuring angles
47.5	16.7	2	Squaring a number
47.5	16.7	2	Square root
47.5	16.7	2	Finding a number when a per cent of it is known
58	8.3	1	Volume of sphere
58	8.3	1	Area of triangle
58	8.3	1	Area of circle
58	8.3	1	Finding length of unknown side of right triangle
58	8.3	1	Acute and obtuse angles
58	8.3	1	Area of parallelogram
58	8.3	1	Volume of cube
58	8.3	1	Volume of cone
58	8.3	1	Volume of pyramid
58	8.3	1	Area of circle using $A = \pi r^2$
58	8.3	1	Circumference using $C = \pi d = 2\pi r$
58	8.3	1	Area of trapezoid
58	8.3	1	Volume of rectangular solid
58	8.3	1	Volume of cylinder
58	8.3	1	Using $\pi$
66	0	0	Micrometer reading

TABLE 80  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING CHILD CARE GUIDANCE STUDENT

RANK	PERCENT	NUMBER	SKILL
4.5	88.9	8	Volume of rectangular solid
4.5	88.9	8	Volume of cube
4.5	88.9	8	Volume of cylinder
4.5	88.9	8	Volume of sphere
4.5	88.9	8	Volume of cone
4.5	88.9	8	Using pi $\pi$
4.5	88.9	8	Circumference using $C = \pi d = 2 \pi r$
4.5	88.9	8	Area of circle using $A = \pi r^2$
9	87.5	7	Volume of pyramid
10.5	77.8	7	Micrometer reading
10.5	77.8	7	Area of trapezoid
12	75	6	Simple algebraic equation with one unknown
14.5	70	7	Changing per cents to common fractions
14.5	70	7	Changing common fractions to per cents
14.5	70	7	Finding per cent of a number
14.5	70	7	Finding what per cent one number is of another
18	66.7	6	Area of circle
18	66.7	6	Finding length of unknown side of right triangle
18	66.7	6	Ratio and proportion
22.5	60	6	Changing per cent to decimals
22.5	60	6	Changing decimals to per cents
22.5	60	6	Decimal equivalents
22.5	60	6	Addition, fractions
22.5	60	6	Finding a number when a per cent of it is known
22.5	60	6	Temperature conversion
28	55.6	5	Measuring angles
28	55.6	5	Area of parallelogram
28	55.6	5	Square root
28	55.6	5	Finding what part one number is of another
28	55.6	5	Finding a number when a fractional part of it is known
37.5	50	5	Addition of decimals
37.5	50	5	Subtraction of decimals
37.5	50	5	Multiplication of decimals
37.5	50	5	Division of decimals
37.5	50	5	Changing decimals to common fractions
37.5	50	5	Subtraction, fractions
37.5	50	5	Multiplication, fractions
37.5	50	5	Division, fractions
37.5	50	5	Comparing fractions
37.5	50	4	Acute and obtuse angles
37.5	50	5	Reducing mixed numbers to simplest form
37.5	50	5	Addition, mixed numbers
37.5	50	5	Division, mixed numbers
37.5	50	5	Rounding off decimals
46	45.5	5	Multiplication, mixed numbers
46	45.5	5	Reading large numbers
46	45.5	5	Rounding numbers
49.5	44.4	4	Area of rectangle
49.5	44.4	4	Area of square
49.5	44.4	4	Squaring a number
49.5	44.4	4	Area of triangle
55.5	40	4	Multiplying whole numbers and decimals by 10,100,etc.
55.5	40	4	Dividing whole numbers and decimals by 10,100,etc.
55.5	40	4	Meaning of percentage
55.5	40	4	Changing common fractions to decimals
55.5	40	4	Reducing fractions to lowest terms
55.5	40	4	Improper fractions, mixed numbers
55.5	40	4	Reading, writing decimals
55.5	40	4	Subtraction, mixed numbers
60	36.4	4	Reading a rule
61	33.3	3	Averages
62.5	27.3	3	Subtraction, whole numbers
62.5	27.3	3	Multiplication, whole numbers
64.5	20	2	Addition, whole numbers
64.5	20	2	Division, whole numbers
66	18.2	2	Liquid measure

TABLE 81  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF GAINFUL HOME ECONOMICS - OTHER TEACHERS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
3.5	95.2	20	Addition, mixed numbers
3.5	95.2	20	Multiplication, whole numbers
3.5	95.2	20	Addition, whole numbers
3.5	95.2	20	Subtraction, whole numbers
3.5	95.2	20	Addition, fractions
3.5	95.2	20	Division, whole numbers
8.5	90.5	19	Averages
8.5	90.5	19	Subtraction, mixed numbers
8.5	90.5	19	Multiplication, mixed numbers
8.5	90.5	19	Division, fractions
11.5	85.7	18	Division, mixed numbers
11.5	85.7	18	Subtraction, fractions
12	81	17	Multiplication, fractions
13	76.2	16	Comparing fractions
14	72.6	16	Meaning of percentage
16.5	71.4	15	Reducing fractions to lowest terms
16.5	71.4	15	Rounding off decimals
16.5	71.4	15	Reading, writing decimals
16.5	71.4	15	Reducing mixed numbers to simplest form
21	66.7	14	Multiplication of decimals
21	66.7	14	Subtraction of decimals
21	66.7	14	Division of decimals
21	66.7	14	Dividing whole numbers and decimals by 10,100,etc.
21	66.7	14	Addition of decimals
26	61.9	13	Finding what per cent one number is of another
26	61.9	13	Changing common fractions to decimals
26	61.9	13	Rounding numbers
25	61.9	13	Improper fractions, mixed numbers
26	61.9	13	Multiplying whole numbers and decimals by 10,100,etc.
29	60	12	Changing per cent to decimals
32.5	57.1	12	Finding per cent of a number
32.5	57.1	12	Changing per cents to common fractions
32.5	57.1	12	Changing decimals to per cents
32.5	57.1	12	Decimal equivalents
35.5	52.4	11	Finding what part one number is of another
35.5	52.4	11	Finding a number when a fractional part of it is known
35.5	52.4	11	Changing decimals to common fractions
35.5	52.4	11	Reading a rule
38	50	10	Ratio and proportion
39	47.9	10	Finding a number when a per cent of it is known
41	47.6	10	Reading large numbers
41	47.6	10	Changing common fractions to per cents
41	47.6	10	Liquid measure
43.5	28.6	6	Area of square
43.5	28.6	6	Area of rectangle
46	23.8	5	Temperature conversion
46	23.8	5	Measuring angles
46	23.8	5	Squaring a number
48	19	4	Area of circle
49	15	3	Simple algebraic equation with one unknown
52	14.3	3	Area of triangle
52	14.3	3	Volume of cylinder
52	14.3	3	Circumference using $C = \pi d = 2\pi r$
52	14.3	3	Area of circle using $A = \pi r^2$
52	14.3	3	Square root
55	10	2	Area of parallelogram
59	9.5	2	Volume of cone
59	9.5	2	Volume of cube
59	9.5	2	Volume of sphere
59	9.5	2	Volume of pyramid
59	9.5	2	Volume of rectangular solid
59	9.5	2	Area of trapezoid
59	9.5	2	Acute and obtuse angles
64.5	4.8	1	Micrometer reading
64.5	4.8	1	Finding length of unknown side of right triangle
64.5	4.8	1	Using pi $\pi$

TABLE 82

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING GAINFUL HOME ECONOMICS OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	80	16	Division, mixed numbers
2.5	77.8	14	Finding what part one number is of another
2.5	77.8	14	Finding a number when a fractional part of it is known
4.5	76.2	16	Division, fractions
4.5	76.2	16	Multiplication, mixed numbers
6.5	75	15	Comparing fractions
6.5	75	15	Improper fractions, mixed numbers
8.5	73.7	14	Changing common fractions to decimals
8.5	73.7	14	Decimal equivalents
11	72.2	13	Finding what per cent one number is of another
11	72.2	13	Finding a number when a per cent of it is known
11	72.2	13	Square root
13.5	71.4	15	Reducing fractions to lowest terms
13.5	71.4	15	Multiplication, fractions
15	70.6	12	Ratio and proportion
16.5	70	14	Rounding off decimals
16.5	70	14	Reducing mixed numbers to simplest form
19	68.4	13	Changing per cents to common fractions
19	68.4	13	Changing decimals to common fractions
19	68.4	13	Measuring angles
22.5	66.7	14	Addition, mixed numbers
22.5	66.7	14	Subtraction, mixed numbers
22.5	66.7	14	Addition, fractions
22.5	66.7	14	Subtraction, fractions
27.5	61.1	11	Changing common fractions to per cents
27.5	61.1	11	Finding per cent of a number
27.5	61.1	11	Simple algebraic equation with one unknown
27.5	61.1	11	Micrometer reading
27.5	61.1	11	Squaring a number
27.5	61.1	11	Changing per cent to decimals
31	58.8	10	Circumference using $C = \pi d = 2\pi r$
32	57.9	11	Changing decimals to per cents
33	57.1	12	Averages
34	56.3	9	Acute and obtuse angles
35.5	55.6	10	Multiplication of decimals
35.5	55.6	10	Division of decimals
37	55	11	Reading, writing decimals
42.5	52.9	9	Area of trapezoid
42.5	52.9	9	Area of parallelogram
42.5	52.9	9	Using pi $\pi$
42.5	52.9	9	Temperature conversion
42.5	52.9	9	Volume of rectangular solid
42.5	52.9	9	Volume of cube
42.5	52.9	9	Volume of cylinder
42.5	52.9	9	Volume of sphere
42.5	52.9	9	Volume of cone
42.5	52.9	9	Volume of pyramid
49	52.6	10	Addition of decimals
49	52.6	10	Subtraction of decimals
49	52.6	10	Meaning of percentage
51.5	50	9	Reading a rule
51.5	50	8	Area of triangle
53.5	47.1	8	Area of circle
53.5	47.1	8	Finding length of unknown side of right triangle
55	45	9	Rounding numbers
56.5	42.1	8	Dividing whole numbers and decimals by 10,100,etc.
56.5	41.2	7	Area of circle using $A = \pi r^2$
58.5	38.1	8	Multiplication, whole numbers
58.5	38.1	8	Division, whole numbers
60	36.8	7	Multiplying whole numbers and decimals by 10,100,etc.
61	35.3	6	Area of rectangle
62	33.3	7	Subtraction, whole numbers
63	31.3	5	Liquid measure
64	29.4	5	Area of square
65	23.8	5	Addition, whole numbers
66	15.8	3	Reading large numbers

TABLE 83

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF FOOD PRODUCTION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	100	40	Addition, whole numbers
2	100	40	Subtraction, whole numbers
2	100	40	Multiplication, whole numbers
4.5	97.5	39	Division, whole numbers
4.5	97.5	39	Liquid measure
6	92.5	37	Addition, fractions
7.5	89.5	34	Reducing fractions to lowest terms
7.5	89.5	34	Division, fractions
9	90	36	Subtraction, fractions
10.5	87.2	34	Reading, writing decimals
10.5	87.2	34	Addition, mixed numbers
12	86.8	33	Multiplication, fractions
13	84.6	33	Subtraction, mixed numbers
14	81.6	31	Rounding off decimals
16	76.9	30	Multiplication, mixed numbers
16	76.9	30	Rounding numbers
16	76.9	30	Meaning of percentage
18	74.4	29	Division, mixed numbers
19.5	73.7	28	Averages
19.5	73.7	28	Changing common fractions to decimals
21	73	27	Reducing mixed numbers to simplest form
22.5	71.8	28	Finding per cent of a number
22.5	71.8	28	Ratio and proportion
24	71.1	27	Multiplication of decimals
25	69.2	27	Temperature conversion
26.5	68.4	26	Improper fractions, mixed numbers
26.5	68.4	26	Dividing whole numbers and decimals by 10, 100, etc.
29	66.7	26	Addition of decimals
29	66.7	26	Changing per cent to decimals
29	66.7	26	Subtraction of decimals
31.5	65.8	25	Multiplying whole numbers and decimals by 10, 100, etc.
31.5	65.8	25	Division of decimals
33.5	64.1	25	Changing decimals to per cents
33.5	61.1	22	Comparing fractions
35	59	23	Reading large numbers
36	56.4	22	Changing decimals to common fractions
37	53.8	21	Changing per cents to common fractions
38	52.6	20	Changing common fractions to per cents
39	50	19	Decimal equivalents
40.5	48.7	19	Finding what part one number is of another
40.5	48.7	19	Finding what per cent one number is of another
42.5	41	16	Finding a number when a fractional part of it is known
42.5	41	16	Finding a number when a per cent of it is known
44	28.2	11	Simple algebraic equation with one unknown
45	25.6	10	Reading a rule
46	12.8	5	Volume of rectangular solid
48	10.3	4	Squaring a number
48	10.3	4	Measuring angles
48	10.3	4	Volume of cube
53.5	7.7	3	Volume of cylinder
53.5	7.7	3	Acute and obtuse angles
53.5	7.7	3	Circumference using $C = \pi d = 2\pi r$
53.5	7.7	3	Area of circle using $A = \pi r^2$
53.5	7.7	3	Using $\pi$
53.5	7.7	3	Area of square
53.5	7.7	3	Area of circle
53.5	7.7	3	Area of rectangle
59.5	5.1	2	Volume of cone
59.5	5.1	2	Volume of pyramid
59.5	5.1	2	Square root
59.5	5.1	2	Finding length of unknown side of right triangle
64	2.6	1	Micrometer reading
64	2.6	1	Volume of sphere
64	2.6	1	Area of triangle
64	2.6	1	Area of parallelogram
64	2.6	1	Area of trapezoid

104

TABLE 84  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING FOOD PRODUCTION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	80	28	Division, fractions
2	79.4	27	Micrometer reading
3	77.8	28	Multiplication, fractions
4	76.5	26	Square root
6.5	75.7	28	Changing common fractions to decimals
6.5	75.7	28	Finding per cent of a number
6.5	75.7	28	Finding what per cent one number is of another
6.5	75.7	28	Comparing fractions
10	75	27	Ratio and proportion
10	75	27	Changing decimals to common fractions
10	75	27	Finding a number when a fractional part of it is known
12	74.3	26	Simple algebraic equation with one unknown
13	73.7	28	Subtraction, fractions
14.5	73.5	25	Area of square
14.5	73.5	25	Area of circle
16.5	73	27	Reducing fractions to lowest terms
16.5	73	27	Reading, writing decimals
18.5	72.7	24	Area of triangle
18.5	72.7	24	Area of trapezoid
20.5	72.2	26	Finding what part one number is of another
20.5	72.2	26	Improper fractions, mixed numbers
22	71.8	28	Addition, fractions
23.5	70.6	24	Area of rectangle
23.5	70.6	24	Acute and obtuse angles
26	69.7	23	Area of parallelogram
26	69.7	23	Volume of rectangular solid
26	69.7	23	Volume of pyramid
28.5	69.4	25	Finding a number when a per cent of it is known
28.5	69.4	25	Changing common fractions to per cents
34	66.7	22	Finding length of unknown side of right triangle
34	67.6	23	Using $\pi$
34	67.6	23	Circumference using $C = \pi d = 2\pi r$
34	67.6	23	Area of circle using $A = \pi r^2$
34	67.6	25	Decimal equivalents
34	67.6	23	Volume of cube
34	67.6	25	Multiplication, mixed numbers
34	67.6	25	Division, mixed numbers
34	67.6	25	Changing per cents to common fractions
40.5	66.7	24	Reducing mixed numbers to simplest form
40.5	66.7	22	Volume of cylinder
40.5	66.7	22	Volume of sphere
40.5	66.7	22	Volume of cone
43	65.8	25	Changing per cent to decimals
44.5	64.9	24	Rounding off decimals
44.5	64.9	24	Meaning of percentage
46	64.7	22	Measuring angles
48	63.2	24	Liquid measure
48	63.2	24	Changing decimals to per cents
48	63.2	24	Addition, mixed numbers
50	62.2	23	Averages
51	61.8	21	Squaring a number
52	61.1	22	Temperature conversion
53.5	60.5	23	Subtraction, mixed numbers
53.5	60.5	23	Division of decimals
55.5	59.5	22	Addition of decimals
55.5	59.5	22	Multiplication of decimals
57.5	55.6	20	Dividing whole numbers and decimals by 10,100,etc.
57.5	55.6	20	Subtraction of decimals
59	55.3	21	Division, whole numbers
60.5	51.4	19	Multiplying whole numbers and decimals by 10,100,etc.
60.5	51.4	18	Reading a rule
62	50	19	Rounding numbers
63	43.6	17	Multiplication, whole numbers
64	42.1	16	Reading large numbers
65.5	30.8	12	Addition, whole numbers
65.5	30.8	12	Subtraction, whole numbers



TABLE 85  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF GAINFUL HOME ECONOMICS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1.5	95.9	Multiplication, whole numbers
1.5	95.9	Addition, whole numbers
3	95.5	Subtraction, whole numbers
4	93.2	Division, whole numbers
5	89	Addition, fractions
6	84.5	Division, fractions
7	83.6	Subtraction, fractions
8	83.3	Addition, mixed numbers
9.5	80.3	Averages
9.5	80.3	Multiplication, fractions
11	79.2	Subtraction, mixed numbers
12	78.9	Reducing fractions to lowest terms
13	76.7	Liquid measure
14	76.4	Multiplication, mixed numbers
15	75	Reading, writing decimals
16	73.6	Meaning of percentage
17	72.2	Division, mixed numbers
18	71.8	Rounding off decimals
19	68.1	Rounding numbers
20	67.6	Multiplication of decimals
21	67.1	Reducing mixed numbers to simplest form
22	66.7	Finding per cent of a number
23	66.2	Dividing whole numbers and decimals by 10, 100, etc.
24.5	65.3	Addition of decimals
24.5	65.3	Subtraction of decimals
27.5	64.8	Changing common fractions to decimals
27.5	64.8	Division of decimals
27.5	64.8	Multiplying whole numbers and decimals by 10, 100, etc.
27.5	64.8	Changing per cent to decimals
30	63.8	Comparing fractions
31	62.5	Changing decimals to per cents
32	62	Improper fractions, mixed numbers
33	59.2	Ratio and proportion
34	54.9	Changing decimals to common fractions
35	54.2	Changing per cents to common fractions
36.5	52.8	Reading large numbers
36.5	52.8	Finding what per cent one number is of another
38.5	52.1	Changing common fractions to per cents
38.5	52.1	Decimal equivalents
40	48.6	Temperature conversion
41	47.2	Finding what part one number is of another
42	43.1	Finding a number when a fractional part of it is known
43	38.9	Finding a number when a per cent of it is known
44	37.5	Reading a rule
45	22.5	Simple algebraic equation with one unknown
46	16.7	Area of square
48	15.3	Area of rectangle
48	15.3	Measuring angles
48	15.3	Squaring a number
50.5	11.1	Area of circle
50.5	11.1	Volume of rectangular solid
52	8.3	Acute and obtuse angles
55	9.7	Circumference using $C = \pi d = 2\pi r$
55	9.7	Area of circle using $A = \pi r^2$
55	9.7	Square root
55	9.7	Volume of cube
55	9.7	Volume of cylinder
59.5	6.9	Area of triangle
59.5	6.9	Volume of cone
59.5	6.9	Volume of pyramid
59.5	6.9	Using pi $\pi$
63.5	5.6	Volume of sphere
63.5	5.6	Area of parallelogram
63.5	5.6	Finding length of unknown side of right triangle
63.5	5.6	Area of trapezoid
66	2.8	Micrometer reading

TABLE 86  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF THE  
TOTAL SAMPLE OF TEACHERS OF GAINFUL HOME ECONOMICS WHO FELT  
THAT THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	74.2	Division, fractions
2.5	73.8	Micrometer reading
2.5	73.8	Finding what per cent one number is of another
4	73	Finding a number when a fractional part of it is known
5	72.6	Ratio and proportion
6	72.1	Square root
7.5	71.6	Multiplication, fractions
7.5	71.6	Comparing fractions
9	71.4	Finding what part one number is of another
10	70.8	Finding per cent of a number
11	70.5	Simple algebraic equation
12	69.7	Changing common fractions to decimals
13	69.2	Changing decimals to common fractions
14	68.8	Finding a number when a per cent of it is known
15	68.6	Addition, fractions
16	68.7	Division, mixed numbers
17	68.3	Circumference using $C = \pi d = 2\pi r$
19	68.2	Changing per cents to common fractions
19	68.2	Improper fractions, mixed numbers
19	68.2	Decimal equivalents
21	68.1	Subtraction, fractions
22.5	67.8	Area of trapezoid
22.5	67.8	Volume of rectangular solid
24	67.6	Reducing fractions to lowest terms
25.5	67.2	Volume of pyramid
25.5	67.2	Changing common fractions to per cents
28	66.7	Volume of cube
28	66.7	Using $\pi$
28	66.7	Multiplication, mixed numbers
31	66.1	Volume of cylinder
31	66.1	Volume of sphere
31	66.1	Volume of cone
33	65.2	Reducing mixed numbers to simplest form
39	65	Area of circle
35	64.5	Measuring angles
36	64.2	Rounding off decimals
37	63.8	Acute and obtuse angles
38	63.6	Changing per cent to decimals
39	63.3	Area of circle using $A = \pi r^2$
40.5	62.7	Area of parallelogram
40.5	62.7	Reading, writing decimals
42	62.3	Addition, mixed numbers
43	62.1	Area of triangle
44	61.2	Changing decimals to per cents
45	61	Finding length of unknown side of right triangle
46	59.4	Subtraction, mixed numbers
47	59	Squaring a number
48	58.7	Temperature conversion
49.5	57.6	Division of decimals
49.5	57.6	Meaning of percentage
51	56.9	Multiplication of decimals
52	56.7	Area of rectangle
52	56.7	Area of square
52	56.7	Averages
55	56.1	Addition of decimals
56	53.8	Subtraction of decimals
57	49.2	Dividing whole numbers and decimals by 10, 100, etc.
58	48.4	Reading a rule
59	47.8	Rounding numbers
60	47.7	Liquid measure
61	45.5	Multiplying whole numbers and decimals by 10, 100, etc.
62	44.9	Division, whole numbers
63	39.4	Multiplication, whole numbers
64	35.3	Reading large numbers
65	31	Subtraction, whole numbers
66	27.1	Addition, whole numbers

TABLE 87  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CHILD DEVELOPMENT TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	100	11	Reading a rule
2	100	12	Subtraction, whole numbers
5	91.7	11	Multiplication, whole numbers
5	91.7	11	Division, whole numbers
5	91.7	11	Liquid measure
7	90.9	10	Reading, writing decimals
8.5	83.3	10	Reading large numbers
8.5	83.3	10	Averages
10.5	75	9	Rounding numbers
10.5	75	9	Addition, fractions
14.5	72.7	8	Division of decimals
14.5	72.7	8	Finding per cent of a number
14.5	72.7	8	Multiplication of decimals
14.5	72.7	8	Addition of decimals
14.5	72.7	8	Subtraction of decimals
14.5	72.7	8	Meaning of percentage
18.5	70	7	Addition, mixed numbers
18.5	70	7	Subtraction, mixed numbers
20	66.7	8	Subtraction, fractions
24.5	63.6	7	Comparing fractions
24.5	63.6	7	Multiplication, mixed numbers
24.5	63.6	7	Division, mixed numbers
24.5	63.6	7	Multiplying whole numbers and decimals by 10, 100, etc.
24.5	63.6	7	Dividing whole numbers and decimals by 10, 100, etc.
24.5	63.6	7	Finding what per cent one number is of another
24.5	63.6	7	Finding what part one number is of another
24.5	63.6	7	Ratio and proportion
29	50	6	Improper fractions, mixed numbers
31.5	58.3	7	Reducing mixed numbers to simplest form
31.5	58.3	7	Reducing fractions to lowest terms
31.5	58.3	7	Division, fractions
31.5	58.3	7	Multiplication, fractions
40	45.5	5	Changing decimals to per cents
40	45.5	5	Finding a number when a fractional part of it is known
40	45.5	5	Rounding off decimals
40	45.5	5	Changing per cent to decimals
40	45.5	5	Decimal equivalents
40	45.5	5	Changing decimals to common fractions
40	45.5	5	Changing common fractions to decimals
40	45.5	5	Changing common fractions to per cents
40	45.5	5	Finding a number when a per cent of it is known
40	45.5	5	Changing per cents to common fractions
40	45.5	5	Area of square
40	45.5	5	Temperature conversion
40	45.5	5	Area of rectangle
47	27.3	3	Simple algebraic equation with one unknown
48	18.2	2	Measuring angles
57.5	0	0	Area of parallelogram
57.5	0	0	Area of circle using $A = \pi r^2$
57.5	0	0	Acute and obtuse angles
57.5	0	0	Using $\pi$
57.5	0	0	Area of trapezoid
57.5	0	0	Circumference using $C = \pi d = 2\pi r$
57.5	0	0	Volume of cube
57.5	0	0	Area of triangle
57.5	0	0	Volume of rectangular solid
57.5	0	0	Area of circle
57.5	0	0	Volume of cylinder
57.5	0	0	Volume of sphere
57.5	0	0	Volume of cone
57.5	0	0	Square root
57.5	0	0	Micrometer reading
57.5	0	0	Squaring a number
57.5	0	0	Volume of pyramid
57.5	0	0	Finding length of unknown side of right triangle

TABLE 88  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING CHILD DEVELOPMENT STUDENT

RANK	PERCENT	NUMBER	SKILL
1	88.9	8	Finding what part one number is of another
4	80	8	Temperature conversion
4	80	8	Ratio and proportion
4	80	8	Multiplication, mixed numbers
4	80	8	Division, mixed numbers
4	80	8	Improper fractions, mixed numbers
9	77.8	7	Finding what per cent one number is of another
9	77.8	7	Finding a number when a per cent of it is known
9	77.8	7	Finding a number when a fractional part of it is known
9	77.8	7	Decimal equivalents
9	77.8	7	Subtraction, mixed numbers
13.5	72.7	8	Multiplication, fractions
13.5	72.7	8	Division, fractions
13.5	72.7	8	Comparing fractions
13.5	72.7	8	Reducing mixed numbers to simplest form
18	70	7	Multiplication of decimals
18	70	7	Division of decimals
18	70	7	Multiplying whole numbers and decimals by 10,100,etc.
18	70	7	Simple algebraic equation with one unknown
18	70	7	Measuring angles
28	66.7	6	Meaning of percentage
28	66.7	6	Changing per cent to decimals
28	66.7	6	Changing decimals to per cents
28	66.7	6	Changing per cents to common fractions
28	66.7	6	Changing common fractions to per cents
28	66.7	6	Acute and obtuse angles
28	66.7	6	Finding length of unknown side of right triangle
28	66.7	6	Volume of rectangular solid
28	66.7	6	Volume of cube
28	66.7	6	Volume of cylinder
28	66.7	6	Volume of sphere
28	66.7	6	Volume of cone
28	66.7	6	Volume of pyramid
28	66.7	6	Changing decimals to common fractions
28	66.7	6	Addition, mixed numbers
36.5	63.6	7	Addition, fractions
36.5	63.6	7	Subtraction, fractions
38.5	62.5	5	Squaring a number
38.5	62.5	5	Square root
40	60	6	Changing common fractions to decimals
40	60	6	Finding per cent of a number
42	57.1	4	Micrometer reading
46	55.6	5	Circumference using $C = \pi d = 2\pi r$
46	55.6	5	Area of circle using $A = \pi r^2$
46	55.6	5	Area of triangle
46	55.6	5	Area of trapezoid
46	55.6	5	Area of circle
46	55.6	5	Dividing whole numbers and decimals by 10,100,etc.
46	55.6	5	Using $\pi$
50.5	54.5	6	Area of rectangle
50.5	54.5	6	Area of square
54	50	5	Addition of decimals
54	50	5	Subtraction of decimals
54	50	5	Rounding off decimals
54	50	5	Area of parallelogram
54	50	6	Averages
57.5	45.5	5	Reading, writing decimals
57.5	45.5	5	Reading a rule
59	41.7	5	Liquid measure
60	36.4	4	Reducing fractions to lowest terms
61	18.2	2	Rounding numbers
62	16.7	2	Division, whole numbers
63	8.3	1	Reading large numbers
65	8.3	1	Addition, whole numbers
65	8.3	1	Subtraction, whole numbers
65	8.3	1	Multiplication, whole numbers

TABLE 89  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CLOTHING TEXTILES TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	93.5	87	Addition, whole numbers
2	89.1	82	Addition, fractions
3	88.2	82	Subtraction, whole numbers
4	84.8	78	Subtraction, fractions
5	77.2	71	Division, whole numbers
6	76.1	70	Multiplication, whole numbers
7	73.3	66	Reducing fractions to lowest terms
8	72.5	66	Addition, mixed numbers
9.5	70.3	64	Subtraction, mixed numbers
9.5	70.3	64	Reading a rule
11	67	61	Reducing mixed numbers to simplest form
12	66.3	61	Multiplication, fractions
13	62	57	Division, fractions
14	61.1	55	Improper fractions, mixed numbers
15	57.1	52	Comparing fractions
16	53.8	49	Multiplication, mixed numbers
17	52.7	48	Meaning of percentage
18	51.1	46	Division, mixed numbers
19.5	47.3	43	Rounding numbers
19.5	47.3	43	Averages
21	45.7	42	Liquid measure
22	41.9	39	Reading large numbers
23	38.9	35	Ratio and proportion
24	36.7	33	Finding per cent of a number
25	34.8	31	Dividing whole numbers and decimals by 10, 100, etc.
26.5	33.3	30	Multiplying whole numbers and decimals by 10, 100, etc.
26.5	33.3	30	Finding what per cent one number is of another
28	33	3	Micrometer reading
29	31.9	29	Reading, writing decimals
30	30.8	28	Rounding off decimals
31	30.3	27	Finding what part one number is of another
32	30.0	27	Changing common fractions to per cents
33.5	29.7	27	Changing common fractions to decimals
33.5	29.7	27	Changing per cents to common fractions
35	28.1	25	Finding a number when a per cent of it is known
36.5	26.7	24	Changing decimals to per cents
36.5	26.7	24	Changing per cent to decimals
38	26.4	24	Changing decimals to common fractions
40	25.6	23	Subtraction of decimals
40	25.6	23	Measuring angles
40	25.6	23	Temperature conversion
43	24.4	22	Finding a number when a fractional part of it is known
43	24.4	22	Multiplication of decimals
43	24.4	22	Addition of decimals
45	23.3	21	Division of decimals
46	22	20	Decimal equivalents
47	20.2	18	Area of square
48	19.1	17	Area of rectangle
49	13.3	12	Area of circle
50	10.1	9	Simple algebraic equation with one unknown
51	10	9	Squaring a number
52	9	8	Circumference using $C = \pi d$ $2\pi r$
53	7.9	7	Area of circle using $A = \pi r^2$
54.5	6.7	6	Area of parallelogram
54.5	6.7	6	Acute and obtuse angles
56.5	5.6	5	Square root
56.5	5.6	5	Area of triangle
58	2.3	2	Using $\pi$
60	2.2	2	Area of trapezoid
60	2.2	2	Volume of cylinder
60	2.2	2	Volume of rectangular solid
63	1.1	1	Volume of sphere
63	1.1	1	Volume of cube
63	1.1	1	Volume of cone
65.5	0	0	Finding length of unknown side of right triangle
65.5	0	0	Volume of pyramid

TABLE 90  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING CLOTHING TEXTILES STUDENT

RANK	PERCENT	NUMBER	SKILL
1	68.3	56	Reducing mixed numbers to simplest form
2	66.7	54	Improper fractions, mixed numbers
3	64.7	44	Ratio and proportion
4	63.5	47	Comparing fractions
5	63.2	55	Subtraction, fractions
6	62.3	43	Temperature conversion
7.5	61	36	Volume of cylinder
7.5	61	36	Volume of sphere
9	60.2	53	Addition, fractions
10.5	60	39	Finding a number when a fractional part of it is known
10.5	60	48	Division, fractions
12.5	59.3	35	Volume of cone
12.5	59.3	35	Volume of pyramid
14.5	59	36	Square root
14.5	59	36	Micrometer reading
16	58	47	Multiplication, fractions
18.5	57.6	34	Volume of rectangular solid
18.5	57.6	34	Volume of cube
18.5	57.6	34	Finding length of unknown side of right triangle
18.5	57.6	34	Area of trapezoid
21	57.4	39	Finding what part one number is of another
22	57	45	Reducing fractions to lowest terms
23	55.9	38	Finding a number when a per cent of it is known
24	55.2	37	Area of triangle
25	55	33	Using pi $\pi$
26	54.4	43	Multiplication, mixed numbers
27	54.2	32	Area of parallelogram
28	54.1	45	Subtraction, mixed numbers
29	54	34	Simple algebraic equation with one unknown
30	53.9	41	Division, mixed numbers
31	53.7	44	Addition, mixed numbers
32.5	53.3	32	Acute and obtuse angles
32.5	53.3	32	Circumference using $C = \pi d = 2\pi r$
34	53.1	43	Reading a rule
35.5	52.5	32	Area of circle using $A = \pi r^2$
35.5	52.5	32	Squaring a number
37	52.4	33	Area of circle
38	52.2	36	Finding what per cent one number is of another
39	52.1	37	Finding per cent of a number
40	50.7	35	Changing decimals to common fractions
41.5	49.3	33	Decimal equivalents
41.5	49.3	34	Changing common fractions to per cents
43	49.2	32	Measuring angles
44	48.6	34	Changing decimals to per cents
45	48.5	33	Changing per cents to common fractions
46	47.1	32	Changing common fractions to decimals
47	46.4	32	Changing per cent to decimals
48.5	43.8	28	Area of rectangle
48.5	43.8	28	Area of square
50.5	42.9	30	Reading, writing decimals
50.5	42.9	30	Rounding off decimals
52	38.4	28	Meaning of percentage
53	36.4	24	Division of decimals
54	35.5	27	Liquid measure
55	35.1	27	Averages
56	31.3	21	Multiplication of decimals
57	30	21	Dividing whole numbers and decimals by 10,100,etc.
58	29	20	Multiplying whole numbers and decimals by 10,100,etc.
59	28.4	19	Subtraction of decimals
60	27.3	18	Addition of decimals
61	26.2	21	Division, whole numbers
62	23.7	18	Rounding numbers
63	23.5	19	Multiplication, whole numbers
64	19.7	15	Reading large numbers
65	19.3	16	Subtraction, whole numbers
66	13.1	11	Addition, whole numbers

TABLE 91

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF COMPREHENSIVE HOME ECONOMICS TEACHERS WHO FELT  
THAT THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	100	77	Addition, whole numbers
2.5	98.7	77	Micrometer reading
2.5	98.7	77	Reading a rule
4	97.4	75	Subtraction, whole numbers
5	96.1	74	Reading, writing decimals
6	93.5	72	Multiplication, whole numbers
7	92.3	72	Subtraction of decimals
8	91	71	Addition of decimals
9	90.9	70	Changing common fractions to decimals
10.5	89.6	69	Liquid measure
10.5	89.6	69	Decimal equivalents
12	88.3	68	Division, whole numbers
13.5	88.2	67	Rounding off decimals
13.5	88.2	67	Addition, fractions
15	84.0	65	Meaning of percentage
16	84.2	64	Subtraction, fractions
17	83.1	64	Ratio and proportion
18	81.8	63	Reducing fractions to lowest terms
19	79.2	61	Changing decimals to common fractions
20	78.9	60	Comparing fractions
21	78.2	61	Volume of cylinder
22	76.3	58	Averages
23.5	76	57	Reading large numbers
23.5	76	57	Rounding numbers
25	75.3	58	Multiplying whole numbers and decimals by 10, 100, etc.
26	74	57	Multiplication of decimals
27	71.1	54	Finding per cent of a number
28	70.7	53	Addition, mixed numbers
29	69.3	52	Dividing whole numbers and decimals by 10, 100, etc.
30	68	51	Subtraction, mixed numbers
31	68.4	52	Multiplication, fractions
32	67.1	51	Division, fractions
33	66.7	50	Reducing mixed numbers to simplest form
34	66.2	51	Changing decimals to per cents
35.5	64.9	50	Changing per cent to decimals
35.5	64.9	50	Division of decimals
37	61.8	47	Area of circle using $A = \pi r^2$
38	60	45	Multiplication, mixed numbers
39.5	59.2	45	Finding what per cent one number is of another
39.5	59.2	45	Area of circle
41	58.1	43	Improper fractions, mixed numbers
42	57.9	44	Temperature conversion
43	56.8	42	Division, mixed numbers
44	56.6	43	Changing common fractions to per cents
45	55.8	43	Using $\pi$
46	55.3	42	Measuring angles
47	53.9	41	Circumference using $C = \pi d = 2\pi r$
48	50.6	39	Changing per cents to common fractions
49	43.1	31	Finding a number when a per cent of it is known
50.5	42.5	31	Finding what part one number is of another
50.5	42.5	31	Finding a number when a fractional part of it is known
52	40.3	31	Squaring a number
53.5	34.7	26	Volume of cube
53.5	34.7	26	Simple algebraic equation with one unknown
55	28	21	Area of square
56	22.7	17	Square root
57	21.3	16	Area of rectangle
58	18.3	13	Volume of rectangular solid
59	17.3	13	Area of parallelogram
61	16	12	Acute and obtuse angles
61	16	12	Volume of sphere
61	16	12	Finding length of unknown side of right triangle
63	10.7	8	Area of triangle
64.5	8.1	6	Volume of pyramid
64.5	8.1	6	Volume of cone
66	4	3	Area of trapezoid

TABLE 92  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING COMPREHENSIVE HOME ECONOMICS STUDENT

RANK	PERCENT	NUMBER	SKILL
1	69.2	99	Ratio and proportion
2	69.1	112	Division, fractions
3	68.3	110	Multiplication, fractions
4	66.4	89	Volume of cylinder
5.5	66.2	86	Volume of cube
5.5	66.2	88	Volume of rectangular solid
7	66.1	84	Volume of sphere
8	65.4	83	Volume of pyramid
9	65	89	Temperature conversion
10	64.8	83	Volume of cone
11	64.2	111	Addition, fractions
12	64.1	84	Area of circle using $A = \pi r^2$
13.5	63.6	84	Circumference using $C = \pi d = 2\pi r$
13.5	63.6	82	Square root
15	63.3	88	Finding a number when a fractional part of it is known
17	63	80	Micrometer reading
17	63	85	Area of circle
17	63	92	Finding a number when a per cent of it is known
19	62.7	84	Simple algebraic equation with one unknown
20.5	62.3	91	Finding what part one number is of another
20.5	62.3	96	Improper fractions, mixed numbers
22	62.1	105	Subtraction, fractions
23.5	61.9	96	Reducing mixed numbers to simplest form
23.5	61.9	83	Finding length of unknown side of right triangle
25	61.8	81	Using pi $\pi$
26	61.6	85	Measuring angles
27	61.5	80	Area of trapezoid
28	60.9	98	Division, mixed numbers
29	60.8	87	Changing common fractions to per cents
30.5	60.7	99	Reducing fractions to lowest terms
30.5	60.7	88	Changing per cents to common fractions
32	60.6	80	Acute and obtuse angles
33	60.5	92	Finding what per cent one number is of another
34	59.7	89	Comparing fractions
35	59.4	92	Finding per cent of a number
36.5	59.1	94	Multiplication, mixed numbers
36.5	59.1	78	Area of parallelogram
38	58.9	96	Subtraction, mixed numbers
39	58.2	92	Reading a rule
40	58	83	Changing common fractions to decimals
41	57.9	77	Area of triangle
42	56.5	78	Changing decimals to common fractions
43	56.4	93	Addition, mixed numbers
44	55.6	80	Changing decimals to per cents
45	55.5	81	Changing per cent to decimals
46	55.3	73	Squaring a number
47	52	79	Area of rectangle
48	51.8	72	Decimal equivalents
49	50	75	Area of square
50	49.4	79	Meaning of percentage
51	44.1	64	Rounding off decimals
52	43.8	64	Multiplication of decimals
53	42.8	68	Averages
54	41.8	61	Division of decimals
55	40.7	68	Liquid measure
56	40.5	60	Reading, writing decimals
57	37.2	54	Subtraction of decimals
58	36.6	53	Addition of decimals
59	36.2	51	Dividing whole numbers and decimals by 10, 100, etc.
60	31.7	46	Multiplying whole numbers and decimals by 10, 100, etc.
61	29.7	51	Division, whole numbers
62	29.2	45	Rounding numbers
63	23.7	40	Multiplication, whole numbers
64	22.7	35	Reading large numbers
65	13.9	24	Subtraction, whole numbers
66	11.6	20	Addition, whole numbers

1.23



TABLE 93  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF CONSUMER EDUCATION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	100	17	Addition, whole numbers
1.5	100	17	Subtraction, whole numbers
4	94.1	16	Division, whole numbers
4	94.1	16	Reading, writing decimals
4	94.1	16	Multiplication, whole numbers
6.5	88.2	15	Rounding off decimals
6.5	88.2	15	Meaning of percentage
8.5	82.4	14	Subtraction of decimals
8.5	82.4	14	Addition of decimals
10	76.5	13	Multiplication of decimals
12	75	12	Changing decimals to per cents
12	75	12	Finding per cent of a number
12	75	12	Changing per cent to decimals
14.5	70.6	12	Division of decimals
14.5	70.6	12	Averages
16	64.7	11	Liquid measure
18	58.8	10	Comparing fractions
18	58.8	10	Subtraction, fractions
18	58.8	10	Addition, fractions
20	58.5	10	Changing common fractions to decimals
21.5	56.3	9	Dividing whole numbers and decimals by 10, 100, etc.
21.5	56.3	9	Multiplying whole numbers and decimals by 10,100,etc
28.5	52.9	9	Division, mixed numbers
28.5	52.9	10	Multiplication, fractions
28.5	52.9	9	Rounding numbers
28.5	52.9	9	Reducing fractions to lowest terms
28.5	52.9	9	Improper fractions, mixed numbers
28.5	52.9	9	Multiplication, mixed numbers
28.5	52.9	9	Subtraction, mixed numbers
28.5	52.9	9	Changing decimals to common fractions
28.5	52.9	9	Division, fractions
28.5	52.9	9	Addition, mixed numbers
28.5	52.9	9	Finding what per cent one number is of another
28.5	52.9	9	Finding a number when a fractional part of it is known
35	50	8	Reducing mixed numbers to simplest form
37	47.1	8	Decimal equivalents
37	47.1	8	Finding what part one number is of another
37	47.1	8	Finding a number when a per cent of it is known
39.5	43.8	7	Changing per cents to common fractions
39.5	43.8	7	Changing common fractions to per cents
41.5	41.2	7	Ratio and proportion
41.5	41.2	7	Reading large numbers
43.5	35.3	6	Simple algebraic equation with one unknown
43.5	35.3	6	Reading a rule
45.5	23.5	4	Area of rectangle
45.5	23.5	4	Area of square
47	17.6	3	Temperature conversion
50	11.8	2	Area of circle
50	11.8	2	Volume of rectangular solid
50	11.8	2	Volume of cube
50	11.8	2	Squaring a number
50	11.8	2	Square root
53.5	5.9	1	Measuring angles
53.5	5.9	1	Area of triangle
60.5	0	0	Circumference using $C = \pi d = 2\pi r$
60.5	0	0	Volume of cylinder
60.5	0	0	Volume of cone
60.5	0	0	Area of circle using $A = \pi r^2$
60.5	0	0	Using $\pi$
60.5	0	0	Volume of sphere
60.5	0	0	Volume of pyramid
60.5	0	0	Micrometer reading
60.5	0	0	Finding length of unknown side of right triangle
60.5	0	0	Acute and obtuse angles
60.5	0	0	Area of parallelogram
60.5	0	0	Area of trapezoid

TABLE 94

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING CONSUMER EDUCATION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	71.4	10	Finding a number when a fractional part of it is known
2	68.8	11	Finding per cent of a number
4	66.7	8	Simple algebraic equation with one unknown
4	66.7	10	Changing per cent to decimals
4	66.7	10	Changing decimals to per cents
6	64.3	9	Comparing fractions
7.5	60	9	Improper fractions, mixed numbers
7.5	60	9	Division, mixed numbers
9	58.8	10	Meaning of percentage
10	57.1	8	Reducing mixed numbers to simplest form
18	56.3	9	Division of decimals
18	56.3	9	Rounding off decimals
18	54.5	6	Area of trapezoid
18	54.5	6	Temperature conversion
18	54.5	6	Volume of rectangular solid
18	54.5	6	Volume of cube
18	54.5	6	Volume of cylinder
18	54.5	6	Volume of sphere
18	54.5	6	Volume of cone
18	54.5	6	Volume of pyramid
18	54.5	6	Using pi
18	54.5	6	Circumference using $C = \pi d = 2\pi r$
18	54.5	6	Area of circle using $A = \pi r^2$
18	54.5	6	Area of rectangle
18	54.5	6	Area of square
26.5	53.8	7	Ratio and proportion
26.5	53.8	7	Finding what part one number is of another
30	53.3	8	Subtraction, mixed numbers
30	53.3	8	Multiplication, mixed numbers
30	53.3	8	Division, fractions
30	53.3	8	Reducing fractions to lowest terms
30	53.3	8	Finding what per cent one number is of another
36	50	7	Changing per cents to common fractions
36	50	7	Changing common fractions to per cents
36	50	7	Finding a number when a per cent of it is known
36	50	8	Addition, fractions
36	50	8	Subtraction, fractions
36	50	6	Reading a rule
36	50	8	Changing common fractions to decimals
41.5	47.1	8	Reading, writing decimals
41.5	46.7	7	Multiplication, fractions
41.5	46.7	7	Changing decimals to common fractions
41.5	46.7	7	Addition, mixed numbers
47.5	45.5	5	Measuring angles
47.5	45.5	5	Acute and obtuse angles
47.5	45.5	5	Finding length of unknown side of right triangle
47.5	45.5	5	Area of parallelogram
47.5	45.5	5	Area of triangle
47.5	45.5	5	Reading large numbers
47.5	45.5	5	Area of circle
47.5	45.5	5	Micrometer reading
52.5	43.8	7	Multiplication of decimals
52.5	43.8	7	Decimal equivalents
54.5	42.9	6	Dividing whole numbers and decimals by 10, 100, etc.
54.5	42.9	6	Rounding numbers
56	38.5	5	Liquid measure
57.5	36.4	4	Squaring a number
57.5	36.4	4	Square root
59	35.7	5	Multiplying whole numbers and decimals by 10, 100, etc.
60.5	35.3	6	Addition of decimals
60.5	35.3	6	Subtraction of decimals
62	31.3	5	Averages
63.5	17.6	3	Addition, whole numbers
63.5	17.6	3	Division, whole numbers
65.5	11.8	2	Subtraction, whole numbers
65.5	11.8	2	Multiplication, whole numbers

TABLE 95  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF FAMILY RELATIONS TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	95	9	Changing decimals to common fractions
2.5	80	16	Addition, whole numbers
2.5	80	16	Subtraction, whole numbers
4	78.9	15	Meaning of percentage
6	75	15	Multiplication, whole numbers
6	75	15	Division, whole numbers
6	75	15	Averages
8	68.4	13	Reading, writing decimals
9	63.2	12	Finding per cent of a number
10	60	12	Addition, fractions
11.5	57.9	11	Dividing whole numbers and decimals by 10, 100, etc.
11.5	57.9	11	Rounding off decimals
13	55	11	Subtraction, fractions
17	52.6	10	Addition, mixed numbers
17	52.6	10	Subtraction, mixed numbers
17	52.6	10	Liquid measure
17	52.6	10	Reading a rule
17	52.6	10	Multiplying whole numbers and decimals by 10, 100, etc
17	52.6	10	Changing per cent to decimals
17	52.6	10	Changing decimals to per cents
23	50	10	Addition of decimals
23	50	10	Subtraction of decimals
23	50	10	Multiplication of decimals
23	50	10	Reading large numbers
23	50	10	Rounding numbers
26.5	47.4	9	Finding what per cent one number is of another
26.5	47.4	9	Changing common fractions to decimals
29.5	45	9	Multiplication, fractions
29.5	45	9	Division, fractions
29.5	45	9	Changing common fractions to per cents
29.5	45	9	Division of decimals
33.5	42.1	8	Multiplication, mixed numbers
33.5	42.1	8	Division, mixed numbers
33.5	42.1	8	Changing per cents to common fractions
33.5	42.1	8	Finding a number when a per cent of it is known
36	40	8	Comparing fractions
38	35	7	Reducing fractions to lowest terms
38	35	7	Improper fractions mixed numbers
38	35	7	Reducing mixed numbers to simplest form
40.5	31.6	6	Area of rectangle
40.5	31.6	6	Area of square
42	30	6	Ratio and proportion
43	27.8	5	Finding what part one number is of another
44	26.3	5	Temperature conversion
45	25	5	Decimal equivalents
46	21.1	4	Simple algebraic equation with one unknown
48.5	15.8	3	Area of triangle
48.5	15.8	3	Measuring angles
48.5	15.8	3	Area of circle
48.5	15.8	3	Finding a number when fractional part of it is known
52.5	10.5	2	Area of trapezoid
52.5	10.5	2	Area of circle using $A = \pi r^2$
52.5	10.5	2	Using $\pi$
52.5	10.5	2	Area of parallelogram
58.5	5.3	1	Volume of rectangular solid
58.5	5.3	1	Volume of cube
58.5	5.3	1	Volume of cylinder
58.5	5.3	1	Volume of sphere
58.5	5.3	1	Volume of cone
58.5	5.3	1	Acute and obtuse angles
58.5	5.3	1	Finding length of unknown side of right triangle
58.5	5.3	1	Circumference using $C = \pi d = 2 \pi r$
64.5	0	0	Squaring a number
64.5	0	0	Square root
64.5	0	0	Volume of pyramid
64.5	0	0	Micrometer reading

TABLE 96  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING FAMILY RELATIONS STUDENT

RANK	PERCENT	NUMBER	SKILL
1	76.9	10	Area of circle using $A = \pi r^2$
2	75	9	Circumference using $C = \pi d = 2\pi r$
5	71.4	10	Area of rectangle
5	71.4	10	Area of square
5	71.4	10	Area of parallelogram
5	71.4	10	Area of triangle
5	71.4	10	Temperature conversion
11.5	69.2	9	Finding what part one number is of another
11.5	69.2	9	Using pi $\pi$
11.5	69.2	9	Area of circle
11.5	69.2	9	Volume of rectangular solid
11.5	69.2	9	Volume of cube
11.5	69.2	9	Volume of sphere
11.5	69.2	9	Volume of cone
11.5	69.2	9	Measuring angles
16.5	68.8	11	Finding per cent of a number
16.5	68.8	11	Finding what per cent one number is of another
19	66.7	10	Decimal equivalents
19	66.7	8	Volume of pyramid
19	66.7	8	Finding a number when a fractional part of it is known
21.5	64.3	9	Area of trapezoid
21.5	64.3	9	Ratio and proportion
23	62.9	9	Volume of cylinder
24.5	62.5	10	Changing common fractions to per cents
24.5	62.5	10	Finding a number when a per cent of it is known
26.5	61.5	8	Simple algebraic equation with one unknown
26.5	61.5	8	Acute and obtuse angles
28	60	9	Changing per cents to common fractions
29.5	58.3	7	Micrometer reading
29.5	58.3	7	Square root
31.5	56.3	9	Changing per cent to decimals
31.5	56.3	9	Changing decimals to per cents
33	53.6	9	Changing common fractions to decimals
36	50	8	Changing decimals to common fractions
36	50	6	Squaring a number
36	50	8	Improper fractions, mixed numbers
36	50	8	Reducing mixed numbers to simplest form
36	50	6	Finding length of unknown side of right triangle
39.5	47.1	8	Addition, fractions
39.5	47.1	8	Subtraction, fractions
43	46.7	7	Multiplication, fractions
43	46.7	7	Division, fractions
43	46.7	7	Comparing fractions
43	46.7	7	Division, mixed numbers
43	46.7	7	Rounding off decimals
46	43.8	7	Reading, writing decimals
47	42.9	6	Multiplication, mixed numbers
49	40	6	Addition, mixed numbers
49	40	6	Subtraction, mixed numbers
49	40	6	Reading a rule
52	37.5	6	Meaning of percentage
52	37.5	6	Liquid measure
52	37.5	6	Reducing fractions to lowest terms
54	33.3	5	Dividing whole numbers and decimals by 10,100,etc.
55.5	29.4	5	Division, whole numbers
55.5	29.4	5	Averages
57	26.7	4	Multiplying whole numbers and decimals by 10,100,etc.
60.5	25	4	Multiplication, whole numbers
60.5	25	4	Rounding numbers
60.5	25	4	Addition of decimals
60.5	25	4	Subtraction of decimals
60.5	25	4	Multiplication of decimals
60.5	25	4	Division of decimals
64	23.5	4	Reading large numbers
65	18.8	3	Subtraction, whole numbers
66	17.6	3	Addition, whole numbers

TABLE 97

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF FOOD AND NUTRITION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	99.3	144	Liquid measure
2	97.9	140	Addition, whole numbers
3	95.2	138	Division, whole numbers
4	94.4	135	Subtraction, whole numbers
5	93	133	Addition, fractions
6	92.4	133	Multiplication, whole numbers
7	84.6	122	Subtraction, fractions
8	83.1	118	Multiplication, fractions
9	80.6	116	Division, fractions
10	75.4	107	Addition, mixed numbers
11	73.6	106	Reducing fractions to lowest terms
12	71.8	102	Subtraction, mixed numbers
13	68.5	98	Meaning of percentage
14	67.1	96	Multiplication, mixed numbers
15	66	95	Division, mixed numbers
16	60.6	86	Reducing mixed numbers to simplest form
17	59.6	84	Finding per cent of a number
18	59.2	84	Averages
19	58.9	83	Improper fractions, mixed numbers
20	57	81	Comparing fractions
21	55.1	76	Rounding numbers
22	55	77	Reading a rule
23	49.6	70	Temperature conversion
24	48.2	68	Reading, writing decimals
25	45	63	Ratio and proportion
26	44.3	62	Addition of decimals
27.5	42.9	60	Multiplying whole numbers and decimals by 10,100,etc.
27.5	42.9	60	Dividing whole numbers and decimals by 10,100, etc.
29	42.1	59	Rounding off decimals
30	42	58	Changing per cent to decimals
31	41.7	58	Changing common fractions to per cents
32	41.3	57	Reading large numbers
33	41	57	Changing percents to common fractions
34	40	56	Subtraction of decimals
35	40.6	56	Changing decimals to per cents
36	39.6	55	Changing common fractions to decimals
37	39.1	55	Finding what per cent one number is of another
38	37.9	53	Multiplication of decimals
39	37.1	52	Division of decimals
40	34.8	48	Finding what part one number is of another
41	32.1	45	Changing decimals to common fractions
42	31.7	44	Finding a number when a fractional part of it is known
43	30.7	43	Area of square
44	30.4	42	Decimal equivalents
45	29.5	41	Finding a number when a per cent of it is known
46	29.3	41	Area of rectangle
47	18.6	26	Area of circle
48	13.7	19	Simple algebraic equation with one unknown
49	12.9	18	Volume of rectangular solid
50	11.4	16	Volume of cylinder
51	10.1	14	Measuring angles
52	10.0	14	Area of triangle
53	9.3	13	Volume of cube
54	8.7	12	Squaring a number
55	7.1	10	Area of parallelogram
56	6.5	9	Acute and obtuse angles
57	6.4	9	Area of trapezoid
58	5.1	7	Volume of cone
59.5	5.0	7	Area of circle using $A = \pi r^2$
59.5	5.0	7	Volume of sphere
61	4.3	6	Circumference using $C = \pi d = 2\pi r$
62	4.3	6	Using $\pi$
63	2.9	4	Square root
64	2.2	3	Finding length of unknown side of right triangle
65.5	1.4	2	Volume of pyramid
65.5	1.4	2	Micrometer reading

TABLE 98

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING IN  
THE TYPICAL ENTERING FOOD AND NUTRITION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	74.1	100	Division, fractions
2	73.2	104	Addition, fractions
3	72.9	97	Multiplication, fractions
4	70.6	96	Subtraction, fractions
5	70.2	80	Ratio and proportion
6	70	84	Temperature conversion
7	68.8	86	Comparing fractions
8	66.9	85	Division, mixed numbers
9	66.1	84	Multiplication, mixed numbers
10	65.2	86	Addition, mixed numbers
11	64.8	83	Subtraction, mixed numbers
12.5	62.7	79	Reducing mixed numbers to simplest form
12.5	62.7	84	Reducing fractions to lowest terms
14	62.5	75	Finding per cent of a number
15	62.2	69	Finding a number when a fractional part of it is known
16	62.1	77	Improper fractions, mixed numbers
17	60.7	71	Changing common fractions to decimals
18	60.5	69	Finding a number when a per cent of it is known
19	59.8	61	Micrometer reading
20	59.1	68	Changing common fractions to per cents
21	58.7	64	Simple algebraic equation with one unknown
22	58.4	66	Changing per cent to decimals
23.5	58.3	70	Reading a rule
23.5	58.3	67	Changing per cents to common fractions
25	57.9	66	Finding what per cent one number is of another
26	57.8	63	Finding what part one number is of another
27	56.9	70	Meaning of percentage
28	56.6	60	Volume of cylinder
29	56.3	58	Square root
30.5	56.2	59	Area of circle using $A = \pi r^2$
30.5	56.2	59	Volume of cone
32	55.8	58	Volume of pyramid
33	55.5	66	Reading, writing decimals
34	55.2	58	Volume of sphere
35	55	60	Volume of rectangular solid
36	54.9	62	Changing decimals to common fractions
37.5	54.7	58	Finding length of unknown side of right triangle
37.5	54.7	58	Using pi $\pi$
40	54.3	57	Area of trapezoid
40	54.3	57	Circumference using $C = \pi d = 2\pi r$
40	54.3	57	Area of parallelogram
42	54.2	58	Area of circle
43	54	61	Changing decimals to per cents
45	53.8	57	Volume of cube
45	53.8	57	Acute and obtuse angles
45	53.8	56	Area of triangle
47	53	62	Rounding off decimals
48	52.8	57	Measuring angles
49	52.7	58	Decimal equivalents
50	52.5	73	Liquid measure
51	51.8	59	Division of decimals
52	51.4	54	Squaring a number
53	51.4	56	Area of rectangle
53	51.4	56	Area of square
55	49.2	61	Averages
56	46.4	65	Division, whole numbers
57	45.6	52	Multiplication of decimals
58	41.9	49	Dividing whole numbers and decimals by 10,100,etc.
59	40.9	47	Multiplying whole numbers and decimals by 10,100,etc.
60	37.4	46	Rounding numbers
61	36.8	42	Subtraction of decimals
62.5	36.2	42	Addition of decimals
62.5	36.2	50	Multiplication, whole numbers
64	34.7	42	Reading large numbers
65	27.2	37	Subtraction, whole numbers
66	25.2	35	Addition, whole numbers

TABLE 99  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF HOUSING HOME FURNISHINGS TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	100	10	Area of rectangle
1.5	100	10	Area of square
4	90	9	Addition, fractions
4	90	9	Subtraction, fractions
4	90	9	Reading a rule
7.5	80	8	Meaning of percentage
7.5	80	8	Reducing fractions to lowest terms
7.5	80	8	Addition, whole numbers
7.5	80	8	Multiplication, fractions
10	77.8	7	Area of circle
12	70	7	Multiplication, whole numbers
12	70	7	Division, whole numbers
12	70	7	Subtraction, whole numbers
16	66.7	6	Area of triangle
16	66.7	6	Addition, mixed numbers
16	66.7	6	Reducing mixed numbers to simplest form
16	66.7	6	Division, mixed numbers
16	66.7	6	Subtraction, mixed numbers
20	60	6	Reading large numbers
20	60	6	Ratio and proportion
20	60	6	Averages
25	55.6	5	Comparing fractions
25	55.6	5	Measuring angles
25	55.6	5	Multiplication, mixed numbers
25	55.6	5	Finding a number when a per cent of it is known
25	55.6	5	Improper fractions, mixed numbers
25	55.6	5	Finding per cent of a number
25	55.6	5	Finding what per cent one number is of another
29.5	50	5	Rounding numbers
29.5	50	5	Squaring a number
32.5	44.4	4	Multiplication of decimals
32.5	44.4	4	Division of decimals
32.5	44.4	4	Subtraction of decimals
32.5	44.4	4	Addition of decimals
36	40	4	Changing decimals to per cents
36	40	4	Changing per cent to decimals
36	40	4	Area of parallelogram
44	33.3	3	Rounding off decimals
44	33.3	3	Square root
44	33.3	3	Changing common fractions to decimals
44	33.3	3	Changing decimals to common fractions
44	33.3	3	Area of trapezoid
44	33.3	3	Acute and obtuse angles
44	33.3	3	Changing per cents to common fractions
44	33.3	3	Decimal equivalents
44	33.3	3	Finding length of unknown side of right triangle
44	33.3	3	Finding what part one number is of another
44	33.3	3	Simple algebraic equation with one unknown
44	33.3	3	Reading, writing decimals
44	33.3	3	Liquid measure
52	30	3	Circumference using $C = \pi d = 2\pi r$
52	30	3	Area of circle using $A = \pi r^2$
52	30	3	Using $\pi$
58.5	22.2	2	Multiplying whole numbers and decimals by 10, 100, etc.
58.5	22.2	2	Dividing whole numbers and decimals by 10, 100, etc.
58.5	22.2	2	Finding a number when a fractional part of it is known
58.5	22.2	2	Changing common fractions to per cents
58.5	22.2	2	Volume of sphere
58.5	22.2	2	Volume of cylinder
58.5	22.2	2	Volume of cube
58.5	22.2	2	Volume of cone
58.5	22.2	2	Volume of pyramid
58.5	22.2	2	Volume of rectangular solid
69	11.1	1	Temperature conversion
65	9	9	Division, fractions
66	0	0	Micrometer reading

107

TABLE 100  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING HOUSING HOME FURNISHINGS STUDENT

RANK	PERCENT	NUMBER	SKILL
2.5	85.7	6	Circumference using $C = \pi d = 2\pi r$
2.5	85.7	6	Area of circle using $A = \pi r^2$
2.5	85.7	6	Measuring angles 85.7
2.5	85.7	6	Square root
6.5	83.3	5	Acute and obtuse angles
6.5	83.3	5	Finding length of unknown side of right triangle
6.5	83.3	5	Finding a number when a per cent of it is known
6.5	83.3	5	Micrometer reading
10	75	6	Squaring a number
10	75	6	Ratio and proportion
10	75	6	Reducing mixed numbers to simplest form
12.5	71.4	5	Area of triangle
12.5	71.4	5	Using pi $\pi$
15	62.5	5	Area of circle
15	62.5	5	Comparing fractions
15	62.5	5	Improper fractions, mixed numbers
17.5	60	6	Area of rectangle
17.5	60	6	Area of square
20.5	57.1	4	Area of parallelogram
20.5	57.1	4	Simple algebraic equation with one unknown
20.5	57.1	4	Finding what per cent one number is of another
20.5	57.1	4	Finding a number when a fractional part of it is known
23	50.1	4	Changing per cents to common fractions
30	50	4	Changing decimals to common fractions
30	50	4	Decimal equivalents
30	50	3	Reading, writing decimals
30	50	3	Volume of rectangular solid
30	50	3	Volume of cube
30	50	3	Volume of cylinder
30	50	3	Volume of sphere
30	50	3	Volume of cone
30	50	3	Volume of pyramid
30	50	5	Reading a rule
30	50	3	Temperature conversion
30	50	3	Finding what part one number is of another
30	50	3	Area of trapezoid
37	44.4	4	Multiplication, fractions
39.5	42.9	3	Finding per cent of a number
39.5	42.9	3	Liquid measure
39.5	42.9	3	Changing common fractions to decimals
39.5	42.9	3	Changing decimals to per cents
43.5	40	4	Division, fractions
43.5	40	4	Reducing fractions to lowest terms
43.5	40	4	Addition, fractions
43.5	40	4	Subtraction, fractions
46	37.5	3	Changing per cent to decimals
48	33.3	2	Changing common fractions to per cents
48	33.3	3	Division, mixed numbers
48	33.3	2	Rounding off decimals
50	30	3	Meaning of percentage
52	25	2	Division of decimals
52	25	2	Multiplying whole numbers and decimals by 10,100,etc.
52	25	2	Multiplication, mixed numbers
54.5	22.2	2	Addition, mixed numbers
54.5	22.2	2	Subtraction, mixed numbers
56	14.3	1	Rounding numbers
58.5	12.5	1	Subtraction of decimals
58.5	12.5	1	Multiplication of decimals
58.5	12.5	1	Dividing whole numbers and decimals by 10,100,etc.
58.5	12.5	1	Averages
61	11.1	1	Division, whole numbers
64	0	0	Addition, whole numbers
64	0	0	Subtraction, whole numbers
64	0	0	Multiplication, whole numbers
64	0	0	Reading large numbers
64	0	0	Addition of decimals



TABLE 101

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF USEFUL HOME ECONOMICS OTHER TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	97	32	Liquid measure
2.5	93.9	31	Subtraction, whole numbers
2.5	93.9	31	Addition, whole numbers
4.5	90.9	30	Addition, fractions
4.5	90.9	30	Meaning of percentage
6	87.9	29	Division, whole numbers
7.5	84.8	28	Subtraction, fractions
7.5	84.8	28	Multiplication, whole numbers
9	75.8	25	Reducing fractions to lowest terms
10	75	24	Reading a rule
11	72.7	24	Multiplication, fractions
12	69.7	23	Division, fractions
14.5	66.7	22	Finding per cent of a number
14.5	66.7	22	Subtraction, mixed numbers
14.5	66.7	22	Addition, mixed numbers
14.5	66.7	22	Rounding numbers
18	63.6	21	Averages
18	63.6	21	Comparing fractions
18	63.6	21	Temperature conversion
21.5	60.6	20	Multiplication, mixed numbers
21.5	60.6	20	Reducing mixed numbers to simplest form
21.5	60.6	20	Improper fractions, mixed numbers
21.5	60.6	20	Finding what per cent one number is of another
24	62.5	20	Ratio and proportion
25.5	57.6	19	Reading, writing decimals
25.5	57.6	19	Rounding off decimals
29	54.5	18	Subtraction of decimals
29	54.5	18	Division of decimals
29	54.5	18	Addition of decimals
29	54.5	18	Multiplication of decimals
29	54.5	18	Division, mixed numbers
32	51.6	16	Reading large numbers
33	51.5	17	Changing common fractions to decimals
34	48.5	16	Decimal equivalents
35	46.9	15	Finding what part one number is of another
36.5	45.5	15	Changing per cent to decimals
36.5	45.5	15	Changing decimals to per cents
40	42.4	14	Changing decimals to common fractions
40	42.4	14	Dividing whole numbers and decimals by 10,100,etc.
40	42.4	14	Changing per cents to common fractions
40	42.4	14	Multiplying whole numbers and decimals by 10,100,etc.
40	42.4	14	Changing common fractions to per cents
43	39.4	13	Area of square
44	34.4	11	Finding a number when a fractional part of it is known
45	33.3	11	Finding a number when a per cent of it is known
46	30.3	10	Area of rectangle
47	24.2	8	Area of circle
48	21.2	7	Simple algebraic equation with one unknown
49	15.2	5	Measuring angles
50.5	12.1	4	Area of triangle
50.5	12.1	4	Squaring a number
53.5	9.1	3	Circumference using $C = \pi d = 2\pi r$
53.5	9.1	3	Micrometer reading
53.5	9.1	3	Area of parallelogram
53.5	9.1	3	Finding length of unknown side of right triangle
58.5	6.1	2	Volume of rectangular solid
58.5	6.1	2	Square root
58.5	6.1	2	Volume of cube
58.5	6.1	2	Area of circle using $A = \pi r^2$
58.5	6.1	2	Using $\pi$
58.5	6.1	2	Area of trapezoid
64	3	1	Acute and obtuse angles
64	3	1	Volume of pyramid
64	3	1	Volume of cylinder
64	3	1	Volume of sphere
64	3	1	Volume of cone

TABLE 102  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING USEFUL HOME ECONOMICS OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	89.7	26	Temperature conversion
2	78.8	26	Addition, fractions
3	78.1	25	Subtraction, fractions
4	75.9	22	Reducing fractions to lowest terms
5	71.4	20	Multiplication, mixed numbers
6	71	22	Multiplication, fractions
7	69.2	18	Division, mixed numbers
8	69	20	Division, fractions
9.5	66.7	20	Finding per cent of a number
9.5	66.7	18	Ratio and proportion
11	64.3	18	Comparing fractions
12	62.1	18	Improper fractions, mixed numbers
14.5	60	15	Area of circle
14.5	60	18	Reducing mixed numbers to simplest form
14.5	60	18	Addition, mixed numbers
14.5	60	18	Subtraction, mixed numbers
18	59.3	16	Finding a number when a per cent of it is known
18	59.3	16	Changing per cent to decimals
18	59.3	16	Changing decimals to per cents
20.5	58.3	14	Finding length of unknown side of right triangle
20.5	58.3	14	Measuring angles
22.5	57.1	16	Finding what part one number is of another
22.5	57.1	16	Finding what per cent one number is of another
25	54.2	13	Circumference using $C = \pi d = 2\pi r$
25	54.2	13	Area of circle using $A = \pi r^2$
25	54.2	13	Area of triangle
27.5	53.8	14	Changing per cents to common fractions
27.5	53.8	14	Changing common fractions
29	53.6	15	Finding a number when a fractional part of it is known
33.5	50	13	Reading, writing decimals
33.5	50	12	Using $\pi$
33.5	50	12	Area of parallelogram
33.5	50	12	Area of trapezoid
33.5	50	12	Volume of cylinder
33.5	50	12	Volume of sphere
33.5	50	12	Volume of cone
33.5	50	12	Volume of pyramid
38	48	12	Area of square
39	47.8	11	Acute and obtuse angles
40	47.6	10	Micrometer reading
41.5	46.2	12	Simple algebraic equation with one unknown
41.5	46.2	12	Changing common fractions to decimals
43.5	45.8	11	Volume of rectangular solid
43.5	45.8	11	Volume of cube
45	45.5	10	Square root
46	43.8	14	Meaning of percentage
47	42.9	12	Reading a rule
48	41.7	10	Area of rectangle
49	39.1	9	Squaring a number
50.5	38.5	10	Changing decimals to common fractions
50.5	38.5	10	Decimal equivalents
52	37	10	Rounding off decimals
53	31.3	10	Liquid measure
54.5	30.8	8	Multiplication of decimals
54.5	30.8	8	Division of decimals
56	28.6	8	Averages
57.5	26.9	7	Addition of decimals
57.5	26.9	7	Subtraction of decimals
59	26.7	8	Division, whole numbers
60.5	25	7	Multiplying whole numbers and decimals by 10,100,etc.
60.5	25	7	Dividing whole numbers and decimals by 10,100,etc.
62	24.1	7	Rounding numbers
63	23.3	7	Multiplication, whole numbers
64	22.2	6	Reading large numbers
65.5	13.3	4	Addition, whole numbers
65.5	13.3	4	Subtraction, whole numbers

TABLE 103

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF USEFUL HOME ECONOMICS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1	95.5	Addition, whole numbers
2	93.3	Subtraction, whole numbers
3	89.8	Division, whole numbers
4	88.7	Addition, fractions
5	88.3	Multiplication, whole numbers
6	84	Liquid measure
7	82.6	Subtraction, fractions
8	73.8	Addition, mixed numbers
9	73.7	Meaning of percentage
10	73.6	Multiplication, fractions
11	72.9	Division, fractions
12	71.8	Reducing fractions to lowest terms
13	71	Subtraction, mixed numbers
14	64.3	Reading a rule
15	62.5	Averages
16	61.1	Multiplication, mixed numbers
17	60.3	Division, mixed numbers
18	60.2	Reducing mixed numbers to simplest form
19	58.4	Improper fractions, mixed numbers
20	57.5	Finding per cent of a number
21	56.8	Rounding numbers
22	55.7	Comparing fractions
23	50.8	Reading, writing decimals
24	47	Ratio and proportion
25	45.6	Addition of decimals
26	44.7	Rounding off decimals
27	44	Subtraction of decimals
28	43.7	Reading large numbers
29	43.6	Finding what per cent one number is of another
31	42.9	Multiplying whole numbers and decimals by 10, 100, etc.
31	42.9	Dividing whole numbers and decimals by 10, 100, etc.
31	42.9	Changing per cent to decimals
33	41.8	Changing decimals to per cents
34	41.6	Multiplication of decimals
35	41.2	Division of decimals
36.5	40.8	Changing common fractions to per cents
36.5	40.8	Changing common fractions to decimals
38	40.7	Changing per cents to common fractions
39	37.2	Finding what part one number is of another
40	36.4	Temperature conversion
41	35.7	Area of square
42	34.7	Area of rectangle
43	34.1	Changing decimals to common fractions
44	33.1	Finding a number when a per cent of it is known
45	32	Decimal equivalents
46	30.8	Finding a number when a fractional part of it is known
47	17.5	Simple algebraic equation with one unknown
48	17.4	Area of circle
49	16.7	Measuring angles
50	10.5	Squaring a number
51	10.1	Area of triangle
52	8.3	Volume of rectangular solid
53	7.5	Volume of cylinder
54	7.3	Area of parallelogram
55	7.1	Area of circle using $A = \pi r^2$
56	6.9	Volume of cube
57	6.7	Circumference using $C = \pi d = 2\pi r$
58	6.5	Acute and obtuse angles
59	5.5	Square root
60.5	4.7	Area of trapezoid
60.5	4.7	Using pi $\pi$
62.5	3.4	Finding length of unknown side of right triangle
62.5	3.4	Volume of sphere
64	3.3	Volume of cone
65	2.4	Micrometer reading
66	1.6	Volume of pyramid

TABLE 104

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF THE  
TOTAL SAMPLE OF TEACHERS OF USEFUL HOME ECONOMICS WHO FELT  
THAT THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	68.3	Ratio and proportion
2	67.9	Temperature conversion
3	67.2	Division, fractions
4	66.2	Multiplication, fractions
5	65.4	Addition, fractions
6	64.6	Subtraction, fractions
7	63.4	Comparing fractions
8	63.1	Reducing mixed numbers to simplest form
9	62.9	Improper fractions, mixed numbers
10	62.3	Finding a number when a fractional part of it is known
11	61.3	Division, mixed numbers
12.5	61	Finding a number when a per cent of it is known
12.5	61	Volume of cylinder
14	60.5	Volume of sphere
15.5	60.2	Finding what part one number is of another
15.5	60.2	Multiplication, mixed numbers
17.5	60	Finding per cent of a number
17.5	60	Volume of cone
19.5	59.9	Volume of pyramid
19.5	59.9	Micrometer reading
21.5	59.6	Area of circle using $A = \pi r^2$
21.5	59.6	Volume of rectangular solid
23	59.5	Reducing fractions to lowest terms
24	59.2	Volume of cube
25	59.1	Simple algebraic equation with one unknown
26.5	58.9	Circumference using $C = \pi d = 2\pi r$
26.5	58.9	Square root
28	58.6	Subtraction, mixed numbers
29	58.5	Finding what per cent one number is of another
30	58.4	Finding length of unknown side of right triangle
31	58	Area of circle
32	57.9	Using pi $\pi$
33	57.5	Area of trapezoid
34.5	57.3	Changing common fractions to per cents
34.5	57.3	Addition, mixed numbers
36	57.2	Measuring angles
37	57.1	Changing per cents to common fractions
38	56.7	Acute and obtuse angles
39	56.4	Area of triangle
40	56.1	Area of parallelogram
41	55.6	Changing common fractions to decimals
42	55.3	Changing per cent to decimals
43	54.9	Reading a rule
44	54.6	Changing decimals to per cents
45	53.3	Changing decimals to common fractions
46	52.5	Squaring a number
47	51.5	Decimal equivalents
48	50.9	Area of rectangle
49	50.5	Area of square
50	49.1	Meaning of percentage
51	46.6	Rounding off decimals
52	46.5	Reading, writing decimals
53	43.3	Division of decimals
54	42.6	Liquid measure
55	41	Averages
56	40.7	Multiplication of decimals
57	36.1	Dividing whole numbers and decimals by 10, 100, etc.
58	34.4	Addition of decimals
59.5	34.2	Multiplying whole numbers and decimals by 10, 100, etc.
59.5	34.2	Subtraction of decimals
61	32.7	Division, whole numbers
62	30	Rounding numbers
63	26.1	Multiplication, whole numbers
64	25.4	Reading large numbers
65	18.3	Subtraction, whole numbers
66	16	Addition, whole numbers

TABLE 105

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF BOOKKEEPING-ACCOUNTING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	100	425	Subtraction, whole numbers
1.5	100	425	Addition, whole numbers
3	99.4	402	Reading large numbers
4	97.4	415	Multiplication, whole numbers
5	95.1	404	Reading, writing decimals
6	94.8	404	Division, whole numbers
7	94.3	396	Meaning of percentage
8	93.2	395	Rounding off decimals
9	91.9	385	Changing per cent to decimals
10	91.4	381	Multiplying whole numbers and decimals by 10,100,etc.
11	91	382	Finding per cent of a number
12	90.9	381	Multiplication of decimals
13	90.8	384	Rounding numbers
14	90.2	378	Addition of decimals
15	89.7	373	Changing decimals to per cents
16	89.2	372	Subtraction of decimals
17	88.6	367	Dividing whole numbers and decimals by 10, 100, etc.
18	84.2	356	Changing common fractions to decimals
19	83.5	348	Division of decimals
20	80	339	Averages
21	79.5	333	Finding what per cent one number is of another
22	79.3	329	Decimal equivalents
23	78.3	325	Changing common fractions to per cents
24	75.3	314	Finding what part one number is of another
25	74.5	310	Changing per cents to common fractions
26	72.5	303	Finding a number when a per cent of it is known
27	71.9	299	Changing decimals to common fractions
28	69.7	294	Reducing fractions to lowest terms
29	67.8	286	Multiplication, fractions
30	66.8	278	Finding a number when a fractional part of it is known
31	66	278	Addition, fractions
32	64.2	271	Multiplication, mixed numbers
33	64.1	270	Subtraction, fractions
34	62.4	262	Addition, mixed numbers
35	61.6	260	Division, fractions
36	61.3	258	Improper fractions, mixed numbers
37	61	257	Subtraction, mixed numbers
38	59.4	250	Reducing mixed numbers to simplest form
39	58.8	247	Comparing fractions
40	58.3	245	Division, mixed numbers
41	43	180	Ratio and proportion
42	22.1	90	Simple algebraic equation with one unknown
43	18.2	75	Reading a rule
44	9.2	38	Squaring a number
45	8.4	35	Liquid measure
46	5.8	24	Area of square
47	5.3	22	Area of rectangle
48	4.1	17	Square root
49	2.7	11	Area of circle
50.5	2.2	9	Measuring angles
50.5	2.2	9	Area of triangle
52	1.9	8	Volume of rectangular solid
54.5	1.7	7	Circumference using $C = \pi d = 2\pi r$
54.5	1.7	7	Area of circle using $A = \pi r^2$
54.5	1.7	7	Using $\pi$
54.5	1.7	7	Temperature conversion
58.5	1	4	Volume of cylinder
58.5	1	4	Acute and obtuse angles
58.5	1	4	Volume of cube
58.5	1	4	Area of parallelogram
61.5	.7	3	Finding length of unknown side of right triangle
61.5	.7	3	Area of trapezoid
63	.5	2	Volume of sphere
65	.2	1	Micrometer reading
65	.2	1	Volume of cone
65	.2	1	Volume of pyramid

TABLE 106  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING BOOKKEEPING-ACCOUNTING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	77.2	309	Finding what per cent one number is of another
2	77.1	269	Ratio and proportion
3	75.5	292	Finding a number when a per cent of it is known
4	74.2	293	Finding what part one number is of another
5	74.1	283	Finding a number when a fractional part of it is known
6	72.4	296	Changing common fractions to decimals
7	71.5	284	Decimal equivalents
8	71.1	216	Finding length of unknown side of right triangle
9	71	215	Volume of sphere
10	70.7	215	Volume of pyramid
11	70.5	215	Acute and obtuse angles
12	70.4	214	Volume of cone
13	70.1	213	Area of trapezoid
14	70	212	Temperature conversion
15	69.7	212	Volume of cylinder
16	69.6	229	Simple algebraic equation with one unknown
17	69.5	212	Volume of cube
18	69.4	211	Micrometer reading
19	69.3	276	Changing common fractions to per cents
20	69.2	272	Changing per cents to common fractions
21.5	68.5	209	Volume of rectangular solid
21.5	68.5	209	Measuring angles
23.5	68.4	208	Area of parallelogram
23.5	68.4	208	Circumference using $A = \pi d = 2\pi r$
25	68.2	208	Using $\pi$
26	68.1	213	Square root
27	67.8	206	Area of circle using $A = \pi r^2$
28	67.7	266	Changing decimals to common fractions
29	67.5	206	Area of circle
30	66.1	201	Area of triangle
31	63.9	262	Finding per cent of a number
32	63.5	195	Area of rectangle
33	63.2	194	Area of square
34	62.9	259	Changing per cent to decimals
35	62.5	253	Changing decimals to per cents
36	61.7	234	Division, mixed numbers
37	61.1	234	Division, fractions
38	60.1	249	Meaning of percentage
39	59.6	239	Division of decimals
40	59.2	184	Liquid measure
41	58.1	219	Comparing fractions
42	52.5	181	Squaring a number
43	56.9	239	Reading, writing decimals
44.5	56.6	220	Multiplication, fractions
44.5	56.6	218	Multiplication, mixed numbers
46	55.3	178	Reading a rule
47	54.7	229	Rounding off decimals
48	54.5	205	Improper fractions, mixed numbers
49	52.9	200	Reducing mixed numbers to simplest form
50	51.6	197	Subtraction, fractions
51	49.7	190	Subtraction, mixed numbers
52	49.5	191	Addition, fractions
53	49.4	196	Reducing fractions to lowest terms
54	48.2	183	Addition, mixed numbers
55	47.4	191	Dividing whole numbers and decimals by 10,100, etc.
56	45.3	185	Multiplication of decimals
57	43.4	175	Averages
58	41.4	168	Multiplying whole numbers and decimals by 10,100, etc.
59	39.6	166	Division, whole numbers
60	39.1	164	Rounding numbers
61	38.2	162	Reading large numbers
62	29.6	120	Subtraction of decimals
63	29	120	Addition of decimals
64	27.2	114	Multiplication, whole numbers
65	25.5	108	Addition, whole numbers
66	21	89	Subtraction, whole numbers

107

TABLE 107  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF BUSINESS DATA PROCESSING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	96.9	62	Subtraction, whole numbers
1.5	96.9	62	Addition, whole numbers
3	93.8	60	Multiplication, whole numbers
4	90.6	58	Division, whole numbers
5.5	89.1	57	Reading large numbers
5.5	89.1	57	Rounding off decimals
7.5	85.9	55	Rounding numbers
7.5	85.9	55	Reading, writing decimals
10	81.3	52	Multiplying whole numbers and decimals by 10, 100, etc.
10	81.3	52	Meaning of percentage
10	81.3	52	Addition of decimals
12.5	79.7	51	Changing decimals to per cents
12.5	79.7	51	Dividing whole numbers and decimals by 10, 100, etc.
14.5	78.1	50	Subtraction of decimals
14.5	78.1	50	Changing per cent to decimals
16	76.6	49	Multiplication of decimals
16	76.6	49	Division of decimals
16	76.6	49	Averages
18	75	48	Finding per cent of a number
19	70.3	45	Finding what per cent one number is of another
20	69.8	44	Changing common fractions to decimals
21	68.8	44	Decimal equivalents
22	62.5	40	Finding a number when a per cent of it is known
23	60.9	39	Finding what part one number is of another
24.5	60.3	38	Subtraction, mixed numbers
24.5	60.3	38	Addition, mixed numbers
27	58.7	37	Changing common fractions to per cents
27	58.7	37	Addition, fractions
27	58.7	37	Multiplication, fractions
30	57.1	36	Multiplication, mixed numbers
30	57.1	36	Subtraction, fractions
30	57.9	36	Division, mixed numbers
32	56.5	35	Reducing mixed numbers to simplest form
33	55.6	35	Changing decimals to common fractions
35	54	34	Changing per cents to common fractions
35	54	34	Division, fractions
35	54	34	Reducing fractions to lowest terms
36	50.8	32	Finding a number when a fractional part of it is known
37	49.2	31	Improper fractions, mixed numbers
38	47.6	30	Comparing fractions
39	41.3	26	Squaring a number
40	39.7	25	Simple algebraic equation with one unknown
41	34.4	22	Ratio and proportion
42	33.3	21	Reading a rule
43	28.6	18	Square root
44	11.3	7	Using pi $\pi$
46.5	9.7	6	Area of square
46.5	9.7	6	Area of circle using $A = \pi r^2$
46.5	9.7	6	Circumference using $C = \pi d = 2\pi r$
46.5	9.7	6	Area of rectangle
49	9.5	6	Measuring angles
50	8.2	5	Volume of cube
51.5	8.1	5	Area of circle
51.5	8.1	5	Area of triangle
56.5	6.5	4	Volume of sphere
56.5	6.5	4	Volume of pyramid
56.5	6.5	4	Volume of cylinder
56.5	6.5	4	Volume of cone
56.5	6.5	4	Finding length of unknown side of right triangle
56.5	6.5	4	Area of parallelogram
56.5	6.5	4	Area of trapezoid
56.5	6.5	4	Volume of rectangular solid
61.5	4.8	3	Liquid measure
61.5	4.8	3	Temperature conversion
63	3.2	2	Acute and obtuse angles
64	1.6	1	Micrometer reading

TABLE 108  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING BUSINESS DATA PROCESSING STUDENT

RANK	PERCENT	NUMBER	SKILL
1	69.4	43	Finding what per cent one number is of another
2	68.9	42	Finding what part one number is of another
3.5	67.2	41	Finding a number when a per cent of it is known
3.5	67.2	39	Changing common fractions to per cents
5	66.7	40	Decimal equivalents
6	66.1	37	Changing per cents to common fractions
7	65.5	38	Finding a number when a fractional part of it is known
8	65	39	Changing common fractions to decimals
9	61.3	38	Finding per cent of a number
10	57.1	32	Changing decimals to common fractions
11	56.9	33	Division, mixed numbers
12	56.5	35	Changing decimals to per cents
13	55.8	29	Ratio and proportion
14	55.7	34	Changing per cent to decimals
15	55.4	31	Comparing fractions
16	54.9	28	Square root
17	54.2	32	Division of decimals
18	53.4	31	Multiplication, mixed numbers
22.5	53.2	33	Meaning of percentage
22.5	53.2	25	Area of trapezoid
22.5	53.2	25	Area of parallelogram
22.5	53.2	25	Volume of rectangular solid
22.5	53.2	25	Volume of cylinder
22.5	53.2	25	Volume of sphere
22.5	53.2	25	Volume of cone
22.5	53.2	25	Volume of pyramid
28.5	52.1	25	Volume of cube
28.5	57.1	24	Circumference using $C = \pi d = 2\pi r$
28.5	51.1	24	Area of circle using $A = \pi r^2$
28.5	51.1	24	Area of circle
31	50.9	29	Reducing mixed numbers to simplest form
32	50.8	30	Multiplication of decimals
34.5	50	24	Micrometer reading
34.5	50	28	Division, fractions
34.5	50	23	Temperature conversion
34.5	50	28	Improper fractions, mixed numbers
37	49.1	28	Multiplication, fractions
38	49	28	Simple algebraic equation with one unknown
39.5	48.9	23	Area of triangle
39.5	48.9	23	Finding length of unknown side of right triangle
42	47.9	23	Area of rectangle
42	47.9	23	Area of square
42	47.9	23	Measuring angles
44	47.4	27	Addition, fractions
45	46.8	22	Acute and obtuse angles
46	46	29	Reading, writing decimals
47	45.9	28	Averages
48	45.8	27	Subtraction, mixed numbers
49	45.8	22	Using $\pi$
50	44.7	21	Liquid measure
51	44.6	25	Reducing fractions to lowest terms
52	44.4	24	Squaring a number
53	43.9	25	Subtraction, fractions
54.5	42.6	23	Reading a rule
54.5	42.6	26	Subtraction of decimals
56	41.9	26	Rounding off decimals
57.5	41	25	Dividing whole numbers and decimals by 10,100,etc.
57.5	41	25	Addition of decimals
59	40.7	24	Addition, mixed numbers
60	39.3	24	Multiplying whole numbers and decimals by 10,100, etc.
61	34.4	21	Division, whole numbers
62	27.9	17	Rounding numbers
63	25.8	16	Multiplication, whole numbers
64	23.4	15	Reading large numbers
65	22.2	14	Subtraction, whole numbers
66	19	12	Addition, whole numbers



TABLE 109  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF BUSINESS EDUCATION OTHER TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	99.4	154	Addition, whole numbers
1.5	99.4	154	Subtraction, whole numbers
3	96.2	150	Multiplication, whole numbers
4	95.5	148	Division, whole numbers
5	94.9	148	Reading, writing decimals
6	94.8	145	Meaning of percentage
7	92.9	143	Addition of decimals
8	91.6	141	Subtraction of decimals
9.5	91	141	Rounding off decimals
9.5	91	141	Multiplication of decimals
11	90.8	139	Changing per cent to decimals
13	90.3	139	Averages
13	90.3	140	Rounding numbers
13	90.3	140	Division of decimals
15	89.5	136	Changing decimals to per cents
16	88.4	137	Finding per cent of a number
17	88.2	135	Multiplying whole numbers and decimals by 10,100,etc.
18	87.7	135	Reading large numbers
19	87.6	134	Dividing whole numbers and decimals by 10,100,etc.
20	86.6	128	Multiplication, mixed numbers
21	85.8	133	Changing common fractions to decimals
22	83.9	130	Finding what per cent one number is of another
23	83.8	129	Addition, fractions
24	83.2	129	Multiplication, fractions
25	82.5	127	Addition, mixed numbers
26	82.5	128	Division, fractions
27.5	81.9	127	Subtraction, fractions
27.5	81.9	127	Division, mixed numbers
29	81.8	126	Changing common fractions to per cents
30.5	81.2	125	Decimal equivalents
30.5	81.2	125	Subtraction, mixed numbers
32.5	80.5	124	Finding what part one number is of another
32.5	80.5	124	Reducing fractions to lowest terms
34	79.9	123	Changing decimals to common fractions
35.5	79.2	122	Finding a number when a per cent of it is known
35.5	79.2	122	Reducing mixed numbers to simplest form
37	78.9	120	Changing per cents to common fractions
38	77.9	120	Improper fractions, mixed numbers
39.5	77.1	118	Finding a number when a fractional part of it is known
39.5	77.1	118	Comparing fractions
41	46.3	69	Ratio and proportion
42	39.5	58	Reading a rule
43	21.9	32	Simple algebraic equation with one unknown
44	20.9	31	Squaring a number
45	20.5	30	Liquid measure
46	13.7	20	Area of rectangle
47	12.3	18	Area of square
48	11.6	17	Square root
49	7.5	11	Area of circle
50.5	6.8	10	Volume of rectangular solid
50.5	6.8	10	Temperature conversion
52	6.2	9	Volume of cube
53.5	5.5	8	Circumference using $C = \pi d = 2\pi r$
53.5	5.5	8	Area of circle using $A = \pi r^2$
55.5	4.8	7	Area of triangle
55.5	4.8	7	Using $\pi$
58.5	4.1	6	Finding length of unknown side of right triangle
58.5	4.1	6	Measuring angles
58.5	4.1	6	Micrometer reading
58.5	4.1	6	Volume of cylinder
61.5	3.4	5	Area of parallelogram
61.5	3.4	5	Area of trapezoid
63	2.7	4	Acute and obtuse angles
65	1.4	2	Volume of pyramid
65	1.4	2	Volume of cone
65	1.4	2	Volume of sphere

TABLE 110  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING BUSINESS EDUCATION OTHER STUDENT

RANK	PERCENT	NUMBER	SKILL
1	85.2	127	Finding a number when a per cent of it is known
2	85	125	Finding a number when a fractional part of it is known
3	83.9	125	Finding what part one number is of another
4	82.7	124	Finding what per cent one number is of another
5	81	119	Decimal equivalents
6	78.3	101	Ratio and proportion
7	78.1	114	Changing decimals to common fractions
8	77.7	115	Changing common fractions to per cents
9	77.5	117	Changing common fractions to decimals
10	75.5	111	Changing per cents to common fractions
11	75.4	89	Volume of cylinder
12	74.3	113	Reading, writing decimals
13	74.2	89	Simple algebraic equation with one unknown
14	73.9	88	Area of circle
15.5	73.8	110	Division, fractions
15.5	73.8	110	Division, mixed numbers
17.5	73.7	87	Volume of sphere
17.5	73.7	87	Volume of cone
19.5	73.1	87	Volume of pyramid
19.5	73.1	87	Micrometer reading
21.5	72.9	86	Area of trapezoid
21.5	72.9	86	Volume of rectangular solid
23	72.8	110	Finding per cent of a number
24	72.3	86	Area of triangle
25	72	85	Finding length of unknown side of right triangle
26	71.9	87	Square root
27	71.7	109	Meaning of percentage
28	71.4	85	Volume of cube
29.5	71.2	84	Acute and obtuse angles
29.5	71.2	84	Using $\pi$
31	70.9	104	Comparing fractions
33.5	70.6	84	Measuring angles
33.5	70.6	84	Area of parallelogram
33.5	70.6	84	Circumference using $C = \pi d = 2\pi r$
33.5	70.6	84	Area of circle using $A = \pi r^2$
36	70.5	86	Temperature conversion
37	69.5	105	Changing decimals to per cents
38	69.1	105	Changing per cent to decimals
39.5	68.9	104	Division of decimals
39.5	68.9	102	Multiplication, mixed numbers
41	66.9	99	Improper fractions, mixed numbers
42	66.2	98	Multiplication, fractions
43	65.6	99	Rounding off decimals
44	64.7	77	Area of square
45	63.9	76	Area of rectangle
46	63.8	95	Reducing mixed numbers to simplest form
47.5	61.7	92	Subtraction, fractions
47.5	61.7	92	Reducing fractions to lowest terms
49	61.5	75	Liquid measure
50	61.1	91	Subtraction, mixed numbers
51	66.1	82	Squaring a number
52	58.4	87	Addition, fractions
53	58.1	72	Reading a rule
54	57.4	85	Addition, mixed numbers
55	56.7	85	Multiplication of decimals
56	56.3	85	Averages
57	54	81	Dividing whole numbers and decimals by 10,100,etc.
58	53	80	Rounding numbers
59	51.3	77	Multiplying whole numbers and decimals by 10,100,etc.
60	44.1	67	Reading large numbers
61	39.2	60	Division, whole numbers
62	38.4	58	Subtraction of decimals
63	38	57	Addition of decimals
64	29.4	45	Multiplication, whole numbers
65	24	37	Addition, whole numbers
66	20.1	31	Subtraction, whole numbers

TABLE 111

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DATA PROCESSING TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
2	100	31	Addition, whole numbers
2	100	31	Subtraction, whole numbers
2	100	31	Reading, writing decimals
5	96.8	30	Rounding off decimals
5	96.8	30	Multiplication, whole numbers
5	96.8	30	Division, whole numbers
8.5	96.6	28	Addition of decimals
8.5	96.6	28	Subtraction of decimals
8.5	96.6	28	Multiplication of decimals
8.5	96.6	28	Division of decimals
11	96.4	27	Finding per cent of a number
12	93.5	29	Averages
15	93.1	27	Multiplying whole numbers and decimals by 10, 100, etc.
15	93.1	27	Dividing whole numbers and decimals by 10, 100, etc.
15	93.1	27	Meaning of percentage
15	93.1	27	Changing per cent to decimals
15	93.1	27	Changing decimals to per cents
18.5	90.3	28	Reading large numbers
18.5	90.3	28	Rounding numbers
20	89.7	26	Decimal equivalents
21	87.1	27	Changing common fractions to decimals
22.5	86.2	25	Changing common fractions to per cents
22.5	86.2	25	Finding what per cent one number is of another
24	83.9	26	Addition, mixed numbers
25.5	82.8	24	Changing decimals to common fractions
25.5	82.8	24	Finding a number when a per cent of it is known
28	80.6	25	Subtraction, mixed numbers
28	80.6	25	Multiplication, mixed numbers
28	80.6	25	Division, mixed numbers
31	79.3	23	Changing per cents to common fractions
31	79.3	23	Squaring a number
31	79.3	23	Finding what part one number is of another
33	78.6	22	Finding a number when a fractional part of it is known
35.5	77.4	24	Addition, fractions
35.5	77.4	24	Subtraction, fractions
35.5	77.4	24	Multiplication, fractions
35.5	77.4	24	Division, fractions
38.5	74.2	23	Reducing fractions to lowest terms
38.5	74.2	23	Comparing fractions
40	71	22	Simple algebraic equation with one unknown
41	69	20	Square root
42.5	67.7	21	Improper fractions, mixed numbers
42.5	67.7	21	Reducing mixed numbers to simplest form
44	57.6	16	Ratio and proportion
46	41.9	13	Area of rectangle
46	41.9	13	Area of square
46	41.9	13	Using $\pi$
48	41.4	12	Reading a rule
50	38.7	12	Area of circle
50	38.7	12	Circumference using $C = \pi d = 2\pi r$
50	38.7	12	Area of circle using $A = \pi r^2$
52	35.5	11	Area of triangle
53	33.3	10	Measuring angles
56	29	9	Area of parallelogram
56	29	9	Volume of rectangular solid
56	29	9	Volume of cube
56	29	9	Finding length of unknown side of right triangle
56	29	9	Area of trapezoid
59	25.8	8	Volume of cylinder
61	22.6	7	Liquid measure
61	22.6	7	Volume of sphere
61	22.6	7	Acute or obtuse angles
63.5	19.4	6	Volume of cone
63.5	19.4	6	Volume of pyramid
65	12.9	4	Temperature conversion
66	3.4	1	Micrometer reading

TABLE 112  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DATA PROCESSING STUDENT

RANK	PERCENT	NUMBER	SKILL
1.5	7.1	2	Multiplying whole numbers and decimals by 10, 100, etc.
1.5	7.1	2	Dividing whole numbers and decimals by 10, 100, etc.
3	61.9	13	Micrometer reading
4	56.7	17	Ratio and proportion
5.5	55.6	15	Volume of cylinder
5.5	55.6	15	Volume of sphere
7	55.2	16	Simple algebraic equation with one unknown
9	53.8	14	Area of trapezoid
9	53.8	14	Volume of cone
9	53.8	14	Volume of pyramid
11	53.6	15	Changing decimals to per cents
12	51.9	14	Finding a number when a fractions part of it is known
13.5	50	14	Finding what per cent one number is of another
13.5	50	13	Area of parallelogram
15	48.4	15	Changing common fractions to decimals
17	48.1	13	Volume of cube
17	48.1	13	Square root
17	48.1	13	Finding a number when a per cent of it is known
19	48	12	Temperature conversion
21	46.4	13	Changing per cents to common fractions
21	46.4	13	Changing common fractions to per cents
21	46.4	13	Changing per cent to decimals
25	44.4	12	Finding length of unknown side of right triangle
25	44.4	12	Circumference using $C = \pi d = 2\pi r$
25	44.4	12	Area of circle using $A = \pi r^2$
25	44.4	12	Finding what part one number is of another
25	44.4	12	Area of triangle
28	42.9	12	Changing decimals to common fractions
29.5	42.3	11	Measuring angles
29.5	42.3	11	Volume of rectangular solid
32	40.7	11	Area of circle
32	40.7	11	Using $\pi$
32	40.7	11	Acute and obtuse angles
34	40	12	Division, fractions
35	39.3	11	Division, mixed numbers
36	37.9	11	Comparing fractions
37.5	37	10	Multiplication, mixed numbers
37.5	37	10	Improper fractions, mixed numbers
39	36.7	11	Multiplication, fractions
41.5	35.7	10	Addition, mixed numbers
41.5	35.7	10	Subtraction, mixed numbers
41.5	35.7	10	Meaning of percentage
41.5	35.7	10	Division of decimals
44	35.5	11	Averages
45	34.6	9	Liquid measure
47.5	33.3	9	Decimal equivalents
47.5	33.3	9	Squaring a number
47.5	33.3	10	Reducing fractions to lowest terms
47.5	33.3	10	Subtraction, fractions
50	32.3	10	Addition, fractions
51.5	32.1	9	Finding per cent of a number
51.5	32.1	9	Multiplication of decimals
53.5	29.6	8	Area of square
53.5	29.6	8	Reducing mixed numbers to simplest form
55	25.9	7	Area of rectangle
56.5	25.8	8	Reading, writing decimals
56.5	25.8	8	Rounding off decimals
58	23.1	6	Reading a rule
59.7	17.9	5	Addition of decimals
59.5	17.9	5	Subtraction of decimals
61	16.1	5	Rounding numbers
62.5	9.7	3	Division, whole numbers
62.5	9.7	3	Reading large numbers
65	6.5	2	Addition, whole numbers
65	6.5	2	Subtraction, whole numbers
65	6.5	2	Multiplication, whole numbers

TABLE 113  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF GENERAL CLERICAL TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	97.1	364	Addition, whole numbers
2	96.8	364	Subtraction, whole numbers
3	96	361	Division, whole numbers
4	94.7	356	Multiplication, whole numbers
5	88.7	331	Reading, writing decimals
6	87.9	326	Reading large numbers
7	87.2	328	Rounding numbers
8	85.8	321	Rounding off decimals
9	85.4	317	Meaning of percentage
10	85.2	317	Addition of decimals
11	84.7	316	Changing per cent to decimals
12.5	84.2	314	Averages
12.5	84.2	314	Subtraction of decimals
14	83.9	313	Changing decimals to per cents
15	83.6	311	Multiplication of decimals
16	82	305	Division of decimals
17	81.5	303	Finding per cent of a number
18	79.7	299	Changing common fractions to decimals
19	79.6	293	Multiplying whole numbers and decimals by 10,100,etc.
20	78	288	Dividing whole numbers and decimals by 10, 100, etc.
21	77.5	290	Addition, fractions
22	77	288	Subtraction, fractions
23.5	76.3	284	Changing common fractions to per cents
23.5	76.3	286	Addition, mixed numbers
28	75.8	282	Finding what per cent one number is of another
26	75.7	284	Multiplication, fractions
27	75.6	279	Decimal equivalents
28	75.4	282	Subtraction, mixed numbers
29	73.3	274	Division, fractions
30	73	273	Multiplication, mixed numbers
31	72.9	272	Reducing fractions to lowest terms
32	71	262	Changing per cents to common fractions
33.5	70.2	259	Changing decimals to common fractions
33.5	70.2	262	Improper fractions, mixed numbers
35	70.1	262	Division, mixed numbers
36.5	68.5	255	Finding a number when a per cent of it is known
36.5	68.5	254	Reducing mixed numbers to simplest form
38	66.2	245	Finding what part one number is of another
39	62.9	232	Comparing fractions
40	60.5	222	Finding a number when a fractional part of it is known
41	3.3	12	Using $\pi$
42	30.6	111	Reading a rule
43	22.6	82	Ratio and proportion
44	13.6	49	Simple algebraic equation with one unknown
45	13.5	49	Squaring a number
46	12.7	46	Liquid measure
47	8.0	29	Area of square
48	7.1	26	Area of rectangle
49	6.4	23	Square root
50	5.0	18	Area of circle
51	4.1	15	Area of triangle
52.5	3.0	11	Micrometer reading
52.5	3.0	11	Area of circle using $A = \pi r^2$
54.5	3	11	Area of parallelogram
54.5	3.0	11	Volume of cube
57	2.8	10	Circumference using $C = \pi d = 2\pi r$
57	2.8	10	Measuring angles
57	2.8	10	Volume of rectangular solid
59	2.2	8	Volume of cylinder
61.5	1.7	6	Temperature conversion
61.5	1.7	6	Volume of cone
61.5	1.7	6	Finding length of unknown side of right triangle
61.5	1.7	6	Area of trapezoid
64.5	1.4	5	Volume of sphere
64.5	1.4	5	Acute and obtuse angles
66	1.1	4	Volume of pyramid

TABLE 114  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING GENERAL CLERICAL STUDENT

RANK	PERCENT	NUMBER	SKILL
1	81.6	271	Finding what part one number is of another
2	81.4	272	Finding a number when a per cent of it is known
3	81	264	Finding a number when a fractional part of it is known
4	80.8	277	Finding what per cent one number is of another
5	77.9	220	Ratio and proportion
6	76.2	208	Finding length of unknown side of right triangle
7.5	76.1	207	Volume of cone
7.5	76.1	207	Volume of pyramid
9.5	76	206	Volume of sphere
9.5	76	209	Micrometer reading
11	75.9	205	Temperature conversion
12	75.4	205	Volume of cylinder
14	75.1	205	Area of circle using $A = \pi r^2$
14	75.1	205	Measuring angles
14	75.1	205	Acute and obtuse angles
16	75	204	Circumference using $C = \pi d = 2\pi r$
17	74.9	203	Area of trapezoid
18.5	74.4	203	Volume of cube
18.5	74.4	203	Using $\pi$
20	74.3	202	Volume of rectangular solid
21	73.8	207	Square root
22	73.3	200	Area of circle
23	73	200	Area of parallelogram
24.5	72.9	250	Changing common fractions to per cents
24.5	72.9	204	Simple algebraic equation with one unknown
26	72.4	197	Area of triangle
27	72.1	245	Changing per cents to common fractions
28.5	72	247	Decimal equivalents
28.5	72	250	Finding per cent of a number
30	71	201	Squaring a number
31	70.1	237	Changing decimals to common fractions
32	70	247	Changing common fractions to decimals
33	69.8	192	Area of rectangle
34	69.7	244	Changing decimals to per cents
35	69.4	243	Changing per cent to decimals
36	69.1	190	Area of square
37	67.9	190	Liquid measure
38.5	67.3	233	Division, fractions
38.5	67.3	237	Meaning of percentage
40.5	64	224	Division of decimals
40.5	64	215	Comparing fractions
42	63.3	217	Division, mixed numbers
43	63.1	186	Reading a rule
44	62.1	218	Multiplication, fractions
45	60.7	210	Multiplication, mixed numbers
46	60.1	215	Reading, writing decimals
47	49	174	Averages
48	47.9	171	Rounding numbers
49.5	59.5	204	Improper fractions, mixed numbers
49.5	59.5	203	Reducing mixed numbers to simplest form
51.5	56.6	205	Rounding off decimals
51.5	56.6	198	Subtraction, fractions
53	56.4	195	Subtraction, mixed numbers
54	54.8	190	Reducing fractions to lowest terms
55	53.9	185	Dividing whole numbers and decimals by 10,100,etc.
56	52.7	185	Multiplication of decimals
57	51.9	181	Addition, fractions
58	50.9	177	Addition, mixed numbers
59	50.1	171	Multiplying whole numbers and decimals by 10,100,etc.
60	38.6	140	Division, whole numbers
61	38.1	134	Subtraction of decimals
62	37.2	131	Addition of decimals
63	35.8	127	Reading large numbers
64	25.2	91	Multiplication, whole numbers
65	19.2	70	Addition, whole numbers
66	18.6	68	Subtraction, whole numbers

TABLE 115

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF STENOGRAPHER/SECRETARY TEACHERS WHO FELT THAT THE  
SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1	87.5	241	Reducing fractions to lowest terms
2	87.1	366	Addition, whole numbers
3	86	361	Subtraction, whole numbers
4	83.6	351	Division, whole numbers
5	82.6	347	Multiplication, whole numbers
6	77.8	326	Reading large numbers
7	77.4	325	Reading, writing decimals
8	73.7	306	Meaning of percentage
9	73.1	305	Averages
10	72.8	305	Rounding numbers
11	70.7	297	Rounding off decimals
12	68.6	286	Addition of decimals
13	68.3	285	Subtraction of decimals
14	67.9	283	Changing per cent to decimals
15	66.7	276	Changing decimals to per cents
16	66.2	276	Multiplication of decimals
17	65.4	272	Finding per cent of a number
18	64.9	270	Division of decimals
19	64.7	269	Multiplying whole numbers and decimals by 10,100,etc.
20	64.6	270	Changing common fractions to per cents
21	64.3	267	Dividing whole numbers and decimals by 10,100,etc.
22	61	256	Addition, fractions
23	60.7	255	Subtraction, fractions
24	59.8	251	Multiplication, fractions
25	59.7	247	Changing common fractions to per cents
26	59.3	249	Addition, mixed numbers
27.5	58.8	244	Decimal equivalents
27.5	58.8	247	Subtraction, mixed numbers
29.5	58.6	243	Finding what per cent one number is of another
29.5	58.6	245	Division, fractions
31	58.1	241	Changing per cents to common fractions
32.5	57.1	240	Improper fractions, mixed numbers
32.5	57.1	240	Multiplication, mixed numbers
34	56.7	236	Changing decimals to common fractions
35	56.1	235	Division, mixed numbers
36	54	224	Finding a number when a per cent of it is known
37	53.7	225	Reducing mixed numbers to simplest form
38	53.5	224	Comparing fractions
39	52.5	218	Finding what part one number is of another
40	48.6	201	Finding a number when a fractional part of it is known
41	25.9	107	Reading a rule
42	17.5	73	Ratio and proportion
43	12.3	51	Squaring a number
44	10.6	44	Simple algebraic equation with one unknown
45	9.4	39	Liquid measure
46.5	6.7	28	Area of rectangle
46.5	6.7	28	Area of square
48	5.3	22	Square root
49	4.8	20	Area of circle
51	3.4	14	Volume of rectangular solid
51	3.4	14	Volume of cube
51	3.4	14	Area of circle using $A = \pi r^2$
53	2.9	12	Area of triangle
54	2.6	11	Volume of cylinder
55	2.4	10	Using $\pi$
56.5	2.2	9	Volume of sphere
56.5	2.2	9	Area of parallelogram
60.5	1.9	8	Temperature conversion
60.5	1.9	8	Circumference using $C = \pi d = 2\pi r$
60.6	1.9	8	Area of trapezoid
60.5	1.9	8	Volume of cone
60.5	1.9	8	Volume of pyramid
60.5	1.9	8	Micrometer reading
64	1.4	6	Measuring angles
65.5	.7	3	Acute and obtuse angles
65.5	.7	3	Finding length of unknown side of right triangle



TABLE 116  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING STENOGRAPHER/SECRETARY STUDENT

RANK	PERCENT	NUMBER	SKILL
1	75.6	270	Finding a number when a fractional part of it is known
2	74.5	271	Finding a number when a per cent of it is known
3	74.4	250	Ratio and proportion
4	74.2	268	Finding what part one number is of another
5	74	236	Finding length of unknown side of right triangle
6	73.9	235	Volume of cylinder
8.5	73.7	235	Circumference using $C = \pi d = 2 \pi r$
8.5	73.7	235	Volume of sphere
8.5	73.7	235	Acute and obtuse angles
8.5	73.7	235	Volume of pyramid
11	73.6	237	Temperature conversion
12	73.5	236	Volume of cone
13	73.4	235	Measuring angles
14	73.2	270	Finding what per cent one number is of another
15	73.1	234	Area of trapezoid
16	73	232	Volume of cube
17	72.7	232	Using $\pi r^2$
18	72.5	232	Area of circle using $A = \pi r^2$
19	72.4	231	Volume of rectangular solid
20	72.3	232	Micrometer reading
21.5	72.2	231	Area of parallelogram
21.5	72.2	231	Area of triangle
23	71.7	231	Area of circle
24	70.7	229	Simple algebraic equation with one unknown
25	70.6	231	Square root
26	69	252	Decimal equivalents
27	67.1	216	Area of rectangle
28	66.3	242	Changing common fractions to per cents
29.5	65.8	240	Changing per cents to common fractions
29.5	65.8	212	Area of square
31	64.7	213	Squaring a number
32	63.5	238	Changing common fractions to decimals
33	63.3	229	Changing decimals to common fractions
34.5	61.6	202	Liquid measure
34.5	61.6	231	Changing per cent to decimals
36	61.4	227	Changing decimals to per cents
37	59.9	223	Finding per cent of a number
38	59	216	Division, mixed numbers
39	58.6	198	Reading a rule
40	58	211	Comparing fractions
41	57.1	209	Division, fractions
42.5	56.3	209	Division of decimals
42.5	56.3	207	Improper fractions, mixed numbers
44	56	214	Meaning of percentage
45.5	54.1	199	Multiplication, mixed numbers
45.5	54.1	198	Reducing mixed numbers to simplest form
47	52.2	192	Multiplication, fractions
48	52	197	Reading, writing decimals
49	50.5	186	Subtraction, mixed numbers
50	48.4	180	Reducing fractions to lowest terms
51	48	178	Subtraction, fractions
52	47.1	178	Rounding off decimals
53	46.7	172	Addition, mixed numbers
54	46.2	170	Dividing whole numbers and decimals by 10,100,etc.
55	44.9	166	Addition, fractions
56	41.8	161	Averages
57	40.5	149	Multiplying whole numbers and decimals by 10,100,etc
58	38.8	144	Multiplication of decimals
59	31.1	121	Rounding numbers
60	28.7	114	Division, whole numbers
61	28.2	106	Subtraction of decimals
62	27.2	108	Reading large numbers
63	27.1	102	Addition of decimals
64	17.7	70	Multiplication, whole numbers
65	12.4	50	Subtraction, whole numbers
66	10.9	44	Addition, whole numbers



TABLE 117  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF BUSINESS OCCUPATIONS WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1	95.3	Addition, whole numbers
2	94.9	Subtraction, whole numbers
3	92.1	Multiplication, whole numbers
4	91.7	Division, whole numbers
5	87.8	Reading, writing decimals
6	87	Reading large numbers
7	85.5	Meaning of percentage
8.5	84.3	Rounding off decimals
8.5	84.3	Rounding numbers
10	82.5	Addition of decimals
11	82.3	Changing per cent to decimals
12	81.5	Subtraction of decimals
13	81.1	Multiplication of decimals
14	81	Changing decimals to per cents
15.5	80	Averages
15.5	80	Finding per cent of a number
17	79.7	Multiplying whole numbers and decimals by 10, 100, etc.
18	78.2	Dividing whole numbers and decimals by 10, 100, etc.
19	78.1	Division of decimals
20	76.8	Changing common fractions to decimals
21	72.5	Finding what per cent one number is of another
22	72.1	Decimal equivalents
23	71.9	Changing common fractions to per cents
24	69.1	Addition, fractions
25	68.8	Multiplication, fractions
26	68.3	Changing per cents to common fractions
27	68.1	Subtraction, fractions
28	67.4	Reducing fractions to lowest terms
29	67.2	Addition, mixed numbers
30	67.1	Changing decimals to common fractions
31.5	66.3	Finding a number when a per cent of it is known
31.5	66.3	Subtraction, mixed numbers
33	66.2	Finding what part one number is of another
34	66.1	Multiplication, mixed numbers
35	65.7	Division, fractions
36	63.7	Improper fractions, mixed numbers
37	63.2	Division, mixed numbers
38	62.1	Reducing mixed numbers to simplest form
39	60.2	Finding a number when a fractional part of it is known
40	59.8	Comparing fractions
41	30.2	Ratio and proportion
42	26.6	Reading a rule
43	17.6	Simple algebraic equation with one unknown
44	13.9	Squaring a number
45	10.9	Liquid measure
46	7.5	Area of square
47	7.3	Area of rectangle
48	6.9	Square root
49	4.6	Area of circle
50	3.4	Area of triangle
51.5	3.3	Area of circle using $A = \pi r^2$
51.5	3.3	Volume of rectangular solid
53.5	3.1	Volume of cube
53.5	3.1	Using $\pi$
55	2.8	Circumference using $C = \pi d = 2\pi r$
56	2.6	Measuring angles
58	2.4	Volume of cylinder
58	2.4	Temperature conversion
58	2.4	Area of parallelogram
60.5	1.9	Micrometer reading
60.5	1.9	Area of trapezoid
62.5	1.6	Volume of sphere
62.5	1.6	Finding length of unknown side of right triangle
64	1.5	Volume of cone
65	1.4	Volume of pyramid
66	1.3	Acute and obtuse angles

TABLE 118  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF BUSINESS OCCUPATIONS WHO FELT THAT  
THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	77.5	Finding a number when a per cent of it is known
2	77.3	Finding what per cent one number is of another
3	77.2	Finding a number when a fractional part of it is known
4	77	Finding what part one number is of another
5	75.5	Ratio and proportion
6	72.6	Volume of sphere
7	72.5	Volume of pyramid
8.5	72.4	Volume of cone
8.5	72.4	Finding length of unknown side of right triangle
10	72.3	Volume of cylinder
12	71.8	Decimal equivalents
12	71.8	Area of trapezoid
12	71.8	Temperature conversion
14	71.7	Acute and obtuse angles
15	71.5	Micrometer reading
16.5	71.2	Volume of cube
16.5	71.2	Circumference using $C = \pi d = 2\pi r$
18.5	71	Volume of rectangular solid
18.5	71	Measuring angles
20	70.6	Area of circle using $A = \pi r^2$
21	70.5	Using pi $\pi$
23.5	70.3	Area of parallelogram
23.5	70.3	Area of circle
23.5	70.3	Simple algebraic equation with one unknown
23.5	70.3	Changing common fractions to per cents
26	70.1	Square root
27	69.6	Changing per cents to common fractions
28.5	69.5	Changing common fractions to decimals
28.5	69.5	Area of triangle
30	67.8	Changing decimals to common fractions
31	65.8	Finding per cent of a number
32	65.5	Area of rectangle
33	65	Area of square
34.5	64.6	Changing decimals to per cents
34.5	64.6	Changing per cent to decimals
36	63.4	Squaring a number
37	62.6	Division, fractions
38	62.5	Division, mixed numbers
39.5	61.8	Liquid measure
39.5	61.8	Meaning of percentage
41	61	Comparing fractions
42	60.7	Division of decimals
43	58.2	Multiplication, mixed numbers
44	58	Reading a rule
45	57.8	Reading, writing decimals
46	57.5	Improper fractions, mixed numbers
47	56.7	Multiplication, fractions
48	56.2	Reducing mixed numbers to simplest form
49	54	Rounding off decimals
50	52.8	Subtraction, mixed numbers
51	52.7	Subtraction, fractions
52	51.7	Reducing fractions to lowest terms
53	49.7	Addition, fractions
54.5	49.2	Addition, mixed numbers
54.5	49.2	Dividing whole numbers and decimals by 10, 100, etc.
56	47	Multiplication of decimals
57	46	Averages
58	44.4	Multiplying whole numbers and decimals by 10, 100, etc.
59	40.2	Rounding numbers
60	36	Division, whole numbers
61	34.4	Reading large numbers
62	33	Subtraction of decimals
63	32.2	Addition of decimals
64	24.2	Multiplication, whole numbers
65	19.3	Addition, whole numbers
66	17.9	Subtraction, whole numbers

1.39

TABLE 119  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF DISTRIBUTIVE EDUCATION TEACHERS WHO FELT THAT THE SKILL  
WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	NUMBER	SKILL
1.5	100	109	Meaning of percentage
1.5	100	111	Addition, whole numbers
3.5	99.1	110	Multiplication, whole numbers
3.5	99.1	110	Subtraction, whole numbers
5.5	98.2	107	Changing per cent to decimals
5.5	98.2	109	Division, whole numbers
7.5	96.3	105	Changing decimals to per cents
7.5	96.3	105	Finding per cent of a number
9	94.6	105	Addition, fractions
11	93.7	104	Subtraction, fractions
11	93.7	104	Reading, writing decimals
11	93.7	104	Averages
13.5	92.8	103	Rounding numbers
13.5	92.8	103	Rounding off decimals
15	91.7	100	Finding what per cent one number is of another
16	91	101	Reducing fractions to lowest terms
18	90.8	99	Subtraction of decimals
18	90.8	99	Multiplying whole numbers and decimals by 10, 100, etc.
18	90.8	99	Addition of decimals
20	90.7	98	Finding a number when a per cent of it is known
21.5	89.9	98	Changing common fractions to per cents
21.5	89.9	98	Multiplication of decimals
23	89.2	99	Multiplication, fractions
24.5	89.1	98	Reading large numbers
24.5	89.1	90	Changing common fractions to decimals
26.5	89	97	Dividing whole numbers and decimals by 10, 100, etc.
26.5	89	97	Changing per cents to common fractions
28.5	88.3	98	Addition, mixed numbers
28.5	88.3	98	Subtraction, mixed numbers
30	87.4	97	Division, fractions
31	88.1	96	Division of decimals
32	87	94	Finding what part one number is of another
33	86.5	96	Multiplication, mixed numbers
34	86.4	95	Reducing mixed numbers to simplest form
35	85.6	95	Improper fractions, mixed numbers
36	85.5	94	Division, mixed numbers
37	85.3	93	Decimal equivalents
38	81.7	89	Changing decimals to common fractions
39	81.5	88	Finding a number when a fractional part of it is known
40	81.1	90	Comparing fractions
41	50.9	55	Reading a rule
42	46.8	51	Ratio and proportion
43	44	48	Liquid measure
44	29.4	32	Simple algebraic equation with one unknown
45	27.9	31	Area of square
46	27	30	Area of rectangle
47	14.7	16	Squaring a number
48	10.7	11	Square root
49	10.1	11	Area of circle
50	8.1	9	Area of triangle
51	6.4	7	Area of parallelogram
52.5	5.5	6	Circumference using $C = \pi d = 2\pi r$
52.5	5.5	6	Measuring angles
56	4.6	5	Using $\pi$
56	4.6	5	Volume of cylinder
56	4.6	5	Volume of cube
56	4.6	5	Area of trapezoid
56	4.6	5	Area of circle using $A = \pi r^2$
59.5	3.7	4	Volume of rectangular solid
59.5	3.7	4	Volume of sphere
61.5	28	3	Volume of pyramid
61.5	28	3	Volume of cone
63	27	3	Acute and obtuse angles
64.5	1.9	2	Micrometer reading
64.5	1.9	2	Temperature conversion
66	1.8	2	Finding length of unknown side of right triangle

TABLE 120

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE  
OF THE TOTAL SAMPLE OF TEACHERS WHO FELT THAT THE SKILL WAS LACKING  
IN THE TYPICAL ENTERING DISTRIBUTIVE EDUCATION STUDENT

RANK	PERCENT	NUMBER	SKILL
1	91.6	98	Finding what per cent one number is of another
2	90.6	96	Finding a number when a per cent of it is known
3	87	94	Finding a number when a fractional part of it is known
4	86.9	93	Finding what part one number is of another
5	86	92	Changing common fractions to per cents
6	82.6	76	Simple algebraic equation with one unknown
7	82.3	79	Ratio and proportion
10.5	81.8	72	Volume of rectangular solid
10.5	81.8	72	Volume of cube
10.5	81.8	72	Volume of cylinder
10.5	81.8	72	Volume of sphere
10.5	81.8	72	Volume of cone
10.5	81.8	72	Volume of pyramid
14.5	81.5	75	Finding length of unknown side of right triangle
14.5	81.5	75	Area of parallelogram
16.5	81.3	74	Area of circle
16.5	81.3	87	Changing decimals to common fractions
18	81.1	73	Area of trapezoid
19.5	80.6	87	Division, fractions
19.5	80.6	87	Finding per cent of a number
21	80.2	85	Changing per cents to common fractions
23	79.3	73	Area of triangle
23	79.3	73	Circumference using $C = \pi d = 2\pi r$
23	79.3	75	Acute and obtuse angles
25	79	83	Division, mixed numbers
27	78.9	86	Decimal equivalents
27	78.9	71	Square root
27	78.9	71	Area of circle using $A = \pi r^2$
29	78.2	68	Micrometer reading
30	78	71	Using pi $\pi$
31	77.5	86	Changing common fractions to decimals
32	77.1	84	Improper fractions, mixed numbers
33	76.9	83	Multiplication, fractions
34	76.6	82	Division of decimals
35	75.9	82	Changing decimals to per cents
36.5	75.8	69	Measuring angles
36.5	75.8	69	Temperature conversion
38	75.7	81	Changing per cent to decimals
39.5	75	81	Reducing mixed numbers to simplest form
39.5	75	81	Comparing fractions
41	74.5	82	Reading, writing decimals
42	74.1	80	Multiplication, mixed numbers
43	73.7	70	Area of rectangle
44	72.6	69	Area of square
45	71.9	64	Squaring a number
46	71.3	77	Meaning of percentage
47.5	70.4	69	Liquid measure
47.5	70.4	76	Subtraction, fractions
50	69.7	76	Reducing fractions to lowest terms
50	69.7	76	Addition, fractions
50	69.7	76	Subtraction, mixed numbers
52	68.8	75	Rounding off decimals
53	67.9	74	Addition, mixed numbers
54	64.6	62	Reading a rule
55	63.6	68	Dividing whole numbers and decimals by 10,100,etc.
56	60	66	Averages
57	58.9	63	Multiplying whole numbers and decimals by 10,100,etc.
58	56.9	62	Multiplication of decimals
59	44.4	48	Subtraction of decimals
60	43.5	47	Addition of decimals
61	41.3	45	Division, whole numbers
62	40	44	Rounding numbers
63	31.5	34	Reading large numbers
64	30.9	34	Multiplication, whole numbers
65	17.3	19	Addition, whole numbers
66	16.4	18	Subtraction, whole numbers

TABLE 121  
RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF  
THE TOTAL SAMPLE OF TEACHERS OF DISTRIBUTIVE EDUCATION WHO FELT THAT  
THE SKILL WAS ESSENTIAL FOR SUCCESS IN THEIR VOCATIONAL SPECIALTY

RANK	PERCENT	SKILL
1.5	100	Addition, whole numbers
1.5	100	Meaning of percentage
3.5	99.1	Subtraction, whole numbers
3.5	99.1	Multiplication, whole numbers
5.5	98.2	Changing per cent to decimals
5.5	98.2	Division, whole numbers
7.5	96.3	Changing decimals to per cents
7.5	96.3	Finding per cent of a number
9	94.6	Addition, fractions
11	93.7	Reading, writing decimals
11	93.7	Subtraction, fractions
11	93.7	Averages
13.5	92.8	Rounding numbers
13.5	92.8	Rounding off decimals
15	91.7	Finding what per cent one number is of another
16	91	Reducing fractions to lowest terms
18	90.8	Addition of decimals
18	90.8	Subtraction of decimals
18	90.8	Multiplying whole numbers and decimals by 10, 100, etc.
20	90.7	Finding a number when a per cent of it is known
21.5	89.9	Changing common fractions to per cents
21.5	89.9	Multiplication of decimals
23	89.2	Multiplication, fractions
24.5	89.1	Reading large numbers
24.5	89.1	Changing common fractions to decimals
26.5	89	Changing per cents to common fractions
26.5	89	Dividing whole numbers and decimals by 10, 100, etc.
28.5	88.3	Addition, mixed numbers
28.5	88.3	Subtraction, mixed numbers
30	88.1	Division of decimals
31	87.4	Division, fractions
32	87	Finding what part one number is of another
33	86.5	Multiplication, mixed numbers
34	86.4	Reducing mixed numbers to simplest form
35	85.6	Improper fractions, mixed numbers
36	85.5	Division, mixed numbers
37	85.3	Decimal equivalents
38	81.7	Changing decimals to common fractions
39	81.5	Finding a number when a fractional part of it is known
40	81.1	Comparing fractions
41	50.9	Reading a rule
42	46.8	Ratio and proportion
43	44	Liquid measure
44	29.4	Simple algebraic equation with one unknown
45	27.9	Area of square
46	27	Area of rectangle
47	14.7	Squaring a number
48.5	10.1	Area of circle
48.5	10.1	Square root
50	8.1	Area of triangle
51	6.4	Area of parallelogram
52.5	5.5	Circumference using $C = \pi d = 2\pi r$
52.5	5.5	Measuring angles
56	4.6	Area of circle using $A = \pi r^2$
56	4.6	Area of trapezoid
56	4.6	Using pi $\pi$
56	4.6	Volume of cube
56	4.6	Volume of cylinder
59.5	3.7	Volume of rectangular solid
59.5	3.7	Volume of sphere
61.5	2.8	Volume of cone
61.5	2.8	Volume of pyramid
63	2.7	Acute and obtuse angles
64.5	1.9	Micrometer reading
64.5	1.9	Temperature conversion
66	1.8	Finding length of unknown side of right triangle

TABLE 122

RANK ORDERING OF BASIC MATHEMATICS SKILLS BY THE PERCENTAGE OF THE  
TOTAL SAMPLE OF TEACHERS OF DISTRIBUTIVE EDUCATION WHO FELT  
THAT THE SKILL WAS LACKING IN THE TYPICAL ENTERING STUDENT

RANK	PERCENT	SKILL
1	91.6	Finding what per cent one number is of another
2	90.6	Finding a number when a per cent of it is known
3	87	Finding a number when a fractional part of it is known
4	86.9	Finding what part one number is of another
5	86	Changing common fractions to per cents
6	82.6	Simple algebraic equation with one unknown
7	82.3	Ratio and proportion
10.5	81.8	Volume of rectangular solid
10.5	81.8	Volume of cube
10.5	81.8	Volume of cylinder
10.5	81.8	Volume of sphere
10.5	81.8	Volume of cone
10.5	81.8	Volume of pyramid
14.5	81.5	Finding length of unknown side of right triangle
14.5	81.5	Area of parallelogram
16.5	81.3	Changing decimals to common fractions
16.5	81.3	Area of circle
18	81.1	Area of trapezoid
19.5	80.6	Division, fractions
19.5	80.6	Finding per cent of a number
21	80.2	Changing per cents to common fractions
23	79.3	Acute and obtuse angles
23	79.3	Circumference using $C = \pi d = 2\pi r$
23	79.3	Area of triangle
25	79	Division, mixed numbers
27	78.9	Decimal equivalents
27	78.9	Area of circle using $A = \pi r^2$
27	78.9	Square root
29	78.8	Using $\pi$
30	78.2	Micrometer reading
31	77.5	Changing common fractions to decimals
32	77.1	Improper fractions, mixed numbers
33	76.9	Multiplication, fractions
34	76.6	Division of decimals
35	75.9	Changing decimals to per cents
36	75.7	Changing per cent to decimals
37.5	75.8	Measuring angles
37.5	75.8	Temperature conversion
39.5	75	Reducing mixed numbers to simplest form
39.5	75	Comparing fractions
41	74.5	Reading, writing decimals
42	74.1	Multiplication, mixed numbers
43	73.7	Area of rectangle
44	72.6	Area of square
45	71.9	Squaring a number
46	71.3	Meaning of percentage
47.5	70.4	Subtraction, fractions
47.5	70.4	Liquid measure
50	69.7	Reducing fractions to lowest terms
50	69.7	Addition, fractions
50	69.7	Subtraction, mixed numbers
52	68.8	Rounding off decimals
53	67.9	Addition, mixed numbers
54	64.6	Reading a rule
55	63.6	Dividing whole numbers and decimals by 10, 100, etc.
56	60	Averages
57	58.9	Multiplying whole numbers and decimals by 10, 100, etc.
58	56.9	Multiplication of decimals
59	44.4	Subtraction of decimals
60	43.5	Addition of decimals
61	41.3	Division, whole numbers
62	40	Rounding numbers
63	31.5	Reading large numbers
64	30.9	Multiplication, whole numbers
65	17.3	Addition, whole numbers
66	16.4	Subtraction, whole numbers

## IMPLICATIONS

This study provides educators with empirical information which can be used in many ways.

Each vocational teacher, for example, can compare his perception of mathematics skill needs with those of his peers. Teachers might also better assist students in understanding that skill in basic mathematics stands high in priority in context of trade related needs. Vocational teachers might also sense an urgency for and promote diagnostic mathematics testing for vocational students. Using such data curriculum builders and administrators, including department heads, might better be able to create more relevant course experiences and exercises. Such revisions might provide closer union between mathematics courses and vocational specialty training. Teachers might also organize remedial experiences for those students found deficient in basic skills on diagnostic testing. Some might become involved with or have responsibility for cooperative or coordinative efforts concerning many mathematics programs in schools sending students to Area Vocational Technical Schools.

Mathematics teachers will be better informed as to their vocational colleagues' views of basic mathematics skill needs in specific vocational training programs. This information in itself might foster in some a new determination to increase emphasis and expect greater student competence in basic math skills, and in correlating mathematics training and review work with the specialty trainings being offered.

Counselors might use such data to help prospective vocational students compare their personal mathematics competency level with that expected in the vocational specialties under consideration. When conformity does not exist between attained and expected patterns, counselors can help students find ways of

remediating the situation or, if that is not possible, to help the student consider alternative programs requiring a different mathematical competence.

In summary, these data can help all educators personalize the mathematics skill development of students enrolled in specialty training programs. Specialty mathematics skill needs are cited, an individual's mathematics competence can be determined, a remedial program can be effected when needed.

By choosing to work together educators might better serve each student in his mathematics and vocational skill development.



## REFERENCES

- Kapes, J. T. "The Relationship Between Selected Characteristics of Ninth Grade Boys and Curriculum Selection and Success in Tenth Grade." Unpublished doctoral thesis. The Pennsylvania State University, 1971.
- Kemp, B. H. The Youth We Haven't Served - A Challenge to Vocational Education. USOE, Department of Health, Education, and Welfare, U.S. Government Printing Office, Washington, 1966.
- Laws, N. G. "Mathematics Needed By the Industrial Technician." Journal of Industrial Teacher Education, Fall, 1967.
- Long, T. E. Math Skill Needs in Secondary Vocational Programs. The Pennsylvania State University, 1970.
- Long, T. E. and Herr, E. L. "Teacher Perceptions of Basic Mathematics Skill Needs in Secondary Vocational Education." Mathematics Teacher, January, 1973.
- Marland, S. P. Speech to National Association of Secondary School Principals, Houston: 1971.
- Osipow, S. H. "What Do We Really Know About Career Development?" Proceedings of the National Conference on Vocational Education, Norman Gysbers, Editor, University of Missouri, October 1969.
- Pennsylvania Education Directory, Secondary, Part I, Programs/Enrollments, Bureau of Vocational Technical and Continuing Education, Department of Education, Harrisburg, Pennsylvania 1971.
- Rhodes, J. A. Alternative to a Decadent Society. Indianapolis: Howard W. Sams and Company, Inc., 1969.
- Schill, W. and Arnold J. Curricula Content for Six Technologies. Urbana: University of Illinois, 1965.
- Schill, W. and Barlow, M. The Role of Mathematics in Electrical-Electronics Technology. Los Angeles University of California, Los Angeles, 1962.
- Venn, G. Man, Education and Work. Washington, D.C.: American Council on Education, 1964.

## APPENDIX

# THE PENNSYLVANIA STATE UNIVERSITY — DEPARTMENT OF VOCATIONAL EDUCATION MATHEMATICS SKILL INVENTORY (MSI)

- What is your Major Teaching Specialty? (Be specific, For example - Home Economics-Foods, Home Economics-Clothing, Machine Shop)
- How many credits have you earned beyond High School? (CHECK ONE)
 

A. 0-30 Credits	D. BS Completed	G. MS Plus
B. 31-60 Credits	E. BS Plus	H. Doctorate
C. 61-90 Credits	F. MS Completed	

00341	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
	0	1	2	3	4	5	6	7	8	9
		A	B	C	D	E	F	G	H	

## DIRECTIONS:

We are trying to learn what basic mathematics skills are absolutely necessary for success in each business, trade, and specialty area taught in public schools. With this information we hope to plan mathematics remedial programs for those students who need them.

For each of the mathematics skills listed below will you please indicate whether the skill is essential for success in your specialty and also whether the skill is missing in the typical student enrolling in your program. Please mark each skill on both dimensions.

USE NO.  
2  
PENCIL  
ONLY

THANK YOU FOR YOUR TIME AND COOPERATION  
PLEASE MARK EACH SKILL ON BOTH DIMENSIONS

SKILL IS ESSENTIAL IN SPECIALTY YES NO	SKILL IS MISSING IN TYPICAL STUDENT YES NO	SKILL IS ESSENTIAL IN SPECIALTY YES NO	SKILL IS MISSING IN TYPICAL STUDENT YES NO	SKILL IS ESSENTIAL IN SPECIALTY YES NO	SKILL IS MISSING IN TYPICAL STUDENT YES NO
<input type="checkbox"/> Reading large numbers	<input type="checkbox"/>	<input type="checkbox"/> Changing decimals to common fractions	<input type="checkbox"/>	<input type="checkbox"/> Liquid measure	<input type="checkbox"/>
<input type="checkbox"/> Rounding numbers	<input type="checkbox"/>	<input type="checkbox"/> Decimal equivalents	<input type="checkbox"/>	<input type="checkbox"/> Temperature conversion	<input type="checkbox"/>
<input type="checkbox"/> Addition, whole numbers	<input type="checkbox"/>	<input type="checkbox"/> Addition of decimals	<input type="checkbox"/>	<input type="checkbox"/> Ratio and proportion	<input type="checkbox"/>
<input type="checkbox"/> Subtraction, whole numbers	<input type="checkbox"/>	<input type="checkbox"/> Subtraction of decimals	<input type="checkbox"/>	<input type="checkbox"/> Measuring angles	<input type="checkbox"/>
<input type="checkbox"/> Multiplication, whole numbers	<input type="checkbox"/>	<input type="checkbox"/> Multiplication of decimals	<input type="checkbox"/>	<input type="checkbox"/> Acute and obtuse angles	<input type="checkbox"/>
<input type="checkbox"/> Division, whole numbers	<input type="checkbox"/>	<input type="checkbox"/> Division of decimals	<input type="checkbox"/>	<input type="checkbox"/> Finding length of unknown side of right triangle	<input type="checkbox"/>
<input type="checkbox"/> Averages	<input type="checkbox"/>	<input type="checkbox"/> Multiplying whole numbers and decimals by 10, 100, etc.	<input type="checkbox"/>	<input type="checkbox"/> Using $\pi$	<input type="checkbox"/>
<input type="checkbox"/> Reducing fractions to lowest terms	<input type="checkbox"/>	<input type="checkbox"/> Dividing whole numbers and decimals by 10, 100, etc.	<input type="checkbox"/>	<input type="checkbox"/> Circumference using $C = \pi d$ or $2\pi r$	<input type="checkbox"/>
<input type="checkbox"/> Addition, fractions	<input type="checkbox"/>	<input type="checkbox"/> Meaning of percents	<input type="checkbox"/>	<input type="checkbox"/> Area of circle using $A = \pi r^2$	<input type="checkbox"/>
<input type="checkbox"/> Subtraction, fractions	<input type="checkbox"/>	<input type="checkbox"/> Changing per cent to decimals	<input type="checkbox"/>	<input type="checkbox"/> Area of rectangle	<input type="checkbox"/>
<input type="checkbox"/> Multiplication, fractions	<input type="checkbox"/>	<input type="checkbox"/> Changing decimals to per cents	<input type="checkbox"/>	<input type="checkbox"/> Area of square	<input type="checkbox"/>
<input type="checkbox"/> Division, fractions	<input type="checkbox"/>	<input type="checkbox"/> Changing per cents to common fractions	<input type="checkbox"/>	<input type="checkbox"/> Area of parallelogram	<input type="checkbox"/>
<input type="checkbox"/> Comparing fractions	<input type="checkbox"/>	<input type="checkbox"/> Changing common fractions to per cents	<input type="checkbox"/>	<input type="checkbox"/> Area of triangle	<input type="checkbox"/>
<input type="checkbox"/> Improper fractions, numbers	<input type="checkbox"/>	<input type="checkbox"/> Finding per cent of a number	<input type="checkbox"/>	<input type="checkbox"/> Area of trapezoid	<input type="checkbox"/>
<input type="checkbox"/> Reducing mixed numbers to simplest form	<input type="checkbox"/>	<input type="checkbox"/> Finding what per cent one number is of another	<input type="checkbox"/>	<input type="checkbox"/> Area of circle	<input type="checkbox"/>
<input type="checkbox"/> Addition, mixed numbers	<input type="checkbox"/>	<input type="checkbox"/> Finding a number when a per cent of it is known	<input type="checkbox"/>	<input type="checkbox"/> Volume of rectangular solid	<input type="checkbox"/>
<input type="checkbox"/> Subtraction, mixed numbers	<input type="checkbox"/>	<input type="checkbox"/> Finding what part one number is of another	<input type="checkbox"/>	<input type="checkbox"/> Volume of cube	<input type="checkbox"/>
<input type="checkbox"/> Multiplication, mixed numbers	<input type="checkbox"/>	<input type="checkbox"/> Finding a number when a fractional part of it is known	<input type="checkbox"/>	<input type="checkbox"/> Volume of cylinder	<input type="checkbox"/>
<input type="checkbox"/> Division, mixed numbers	<input type="checkbox"/>	<input type="checkbox"/> Squaring a number	<input type="checkbox"/>	<input type="checkbox"/> Volume of sphere	<input type="checkbox"/>
<input type="checkbox"/> Reading, writing decimals	<input type="checkbox"/>	<input type="checkbox"/> Square root	<input type="checkbox"/>	<input type="checkbox"/> Volume of cone	<input type="checkbox"/>
<input type="checkbox"/> Rounding off decimals	<input type="checkbox"/>	<input type="checkbox"/> Reading a rule	<input type="checkbox"/>	<input type="checkbox"/> Volume of pyramid	<input type="checkbox"/>
<input type="checkbox"/> Changing common fractions to decimals	<input type="checkbox"/>	<input type="checkbox"/> Micrometer reading	<input type="checkbox"/>	<input type="checkbox"/> Simple algebraic equation with one unknown	<input type="checkbox"/>

PS 7018 PS (4710)

LISTING OF VOCATIONAL SPECIALTIES  
WITH TOTAL NUMBER (N) INCLUDED  
IN EACH SPECIALTY

Trade and Industrial

Air Conditioning and Heating	19
Appliance Repair	29
Automotive Body	66
Automotive Mechanic	78
Building Construction Maintenance	30
Carpentry	49
Cosmetology	50
Drafting	44
Dressmaking Related	20
Electrical Maintenance Construction	39
Electronics	49
Industrial Electrical	20
Interior Decorating/Commercial Art	26
Machine Tool Die	100
Masonry	26
Metal Trade	10
Mill and Cabinet Making	28
Printing Graphic Arts	47
Plumbing	16
Sheet Metal	16
T & I Others	34
Welding	39
Woodworking	18

TOTAL Tables from Trade and Industrial Occupations 853

Technical Occupations

Building Technology	14
Chemical Technology	12
Drafting Design	34
Electronics Technology	32
Technical Other	59

TOTAL Tables for Technical Occupations 151

Health Occupations

Dental Occupations	9
Health Assistant	20
Health Other	24

TOTAL Tables for Health Occupations 53

Agricultural Occupations

Agricultural Mechanics	15
Agriculture Other	48
Agricultural Production	98
Horticulture	18

TOTAL Tables for Agricultural Occupations 179

Gainful Home Economics

Child Care Guidance	12
Gainful Home Economics	21
Food Production	40

TOTAL Tables for Gainful Home Economics 73

Useful Home Economics

Child Development	12
Clothing Textiles	93
Comprehensive Home Economics	179
Consumer Education	17
Family Relations	20
Food Nutrition	146
Housing Home Furnishings	10
Useful Home Economics Other	33

TOTAL Tables for Useful Home Economics 510

Business Occupations

Bookkeeping-Accounting	426
Business Data Processing	64
Business Education Other	157
Data Processing	31
General Clerical	376
Stenographer/Secretary	420

TOTAL Tables for Business Occupations 1474

Distributive Education

Distributive Education 111

TOTAL Tables for Distributive Education 111

Survey Total (N) 3404